INFORMATION SERVICES INDUSTRY

ANNUAL EXECUTIVE PRESENTATION

1988

INPUT

About INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Continuous-information advisory services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services (software, processing services, turnkey systems, systems integration, professional services, communications, systems/software maintenance and support).

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

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INFORMATION SERVICES INDUSTRY DIRECTIONS

INPUT ANNUAL
EXECUTIVE PRESENTATION
1988

https://archive.org/details/informationservi01unse_0

Fundamental Driving Forces
Key Business Trends:

Shorter Product Life Cycles

More Customization/Specialization

Narrower Market Segments

Higher Impact of Technology

More Competition

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NOTES:

JJ88-DW1-3

Fundamental Driving Forces

- *Apply to the Information Services Industry*

- *Are Restructuring the Role of IS*
  - Reactive to Proactive
  - Technology-Driven to User-Driven
  - Centralized To "Federated"

- *And Changing the Formula for Success*

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NOTES:

JJ88-DW1-4

INPL

Information Systems—Major Issues

- Rising Management Expectations

- User Demands for Increasingly Complex Solutions

- Managing the Technology Investment

- Integration of Data/Technology/Applications

- Delivery of "Mission Critical" Systems

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NOTES:

JJ88-DW1-5A,B

Blocking Factors

- Infrastructure Gridlock

- Lack of Qualified In-House Personnel

- Existing Applications Portfolio

- Organizational Response Time
Create Opportunities for the Information Services Industry

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NOTES:

JJ88-DW1-6

Information Systems
Priorities—1989

- Audit the Data Management Function

- Review IS Budget Control Policies

- Review Use of External Products
  and Services

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NOTES:

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Information Systems Priorities—1989

- Prepare End-User Support for the Next Wave

- Experiment with Connectivity

- Assign Responsibility for Standards

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NOTES:

JJ88-DT2-39b

INPL

Information Systems Priorities—Beyond 1989

- Clear Expectations of IS
- Identify Mission Critical Processes
- Application Development—Use All Alternatives

INPUT

NOTES:

JJ88-DT2-40a

Information Systems Priorities—Beyond 1989

- Data Management—Company-Wide Orientation

- Technology Architecture—Network Management

- Central IS—Consulting Role

INPUT

NOTES:

JJ88-DT2-40b

Information Systems Executive Role in the 1990s
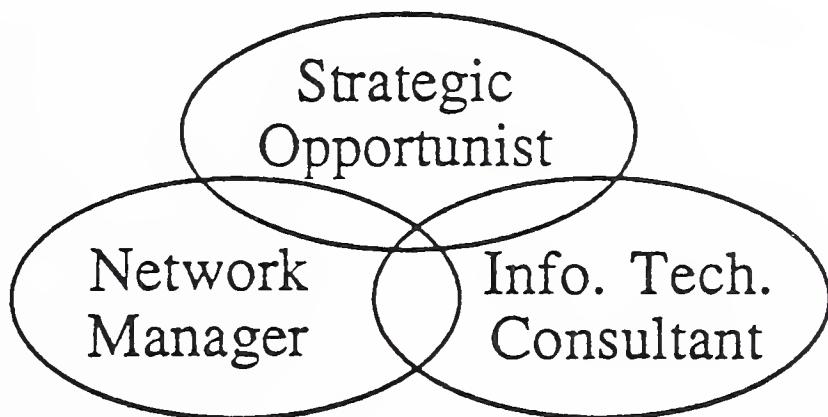
An Internal "Systems Integrator"

INPUT

NOTES:

JJ88-DT2-41

INPUT

IS Organization in the 1990s

Not Centralized

        Not Decentralized

               <u>Federated</u>

Brought together "by agreement of
each party to sublimate its power
to the central authority in common
affairs." - Webster

INPUT

NOTES:

JJ88-DW1-7

INPU

Federated IS Organization

Federal Government	Corporate IS
Defense	Competition
Treaties	Partnerships
Regulation	Standards
National Programs	Corporate Systems
National Policies	Corporate Policies

INPUT

NOTES:

JJ88-DW1-8

INPUT

Federated IS Organization

State Government	Unit IS
Citizens	Customers
Local Issues	Business Support
Operating Programs	Operating Systems
Policy Implementation	Policy Implementation

INPUT

NOTES:

JJ88-DW1-9

INPU

<u>IS</u> Responsibilities—1990s

- Treat "Users" as Customers

- Analyze "Make" or "Buy" Decisions

- Consult on Strategy and Direction

- Support Organizational Units at All Levels in Use of:
  - Information
  - Information Systems and Services
  - Information Technology

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NOTES:

JJ88-DW1-10A,B

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1988 User Research Activity

Questionnaire	No. Interviews	No. Industries
Budget & Issues	211	15
Application Development	103	12
Data Administration	100	11
Issues Studies	200	NA

INPUT

NOTES:

JJ88-DT2-3

INP

Research Demographics
Size of Information Systems Budget

NOTES:

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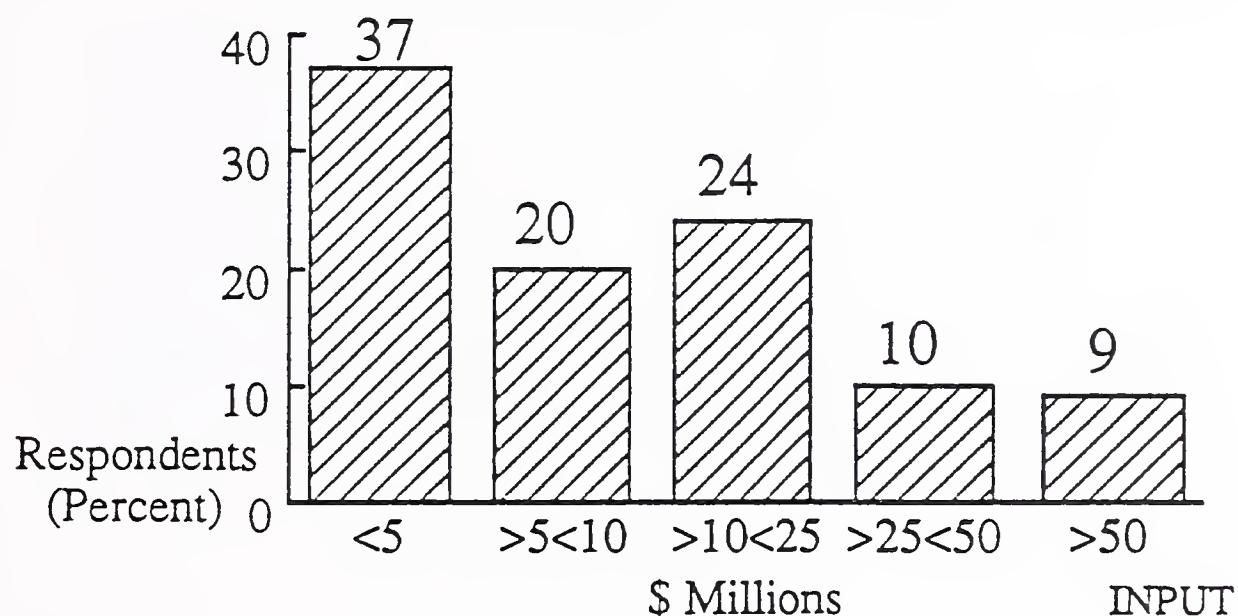
Information Systems
Budget Growth Rate
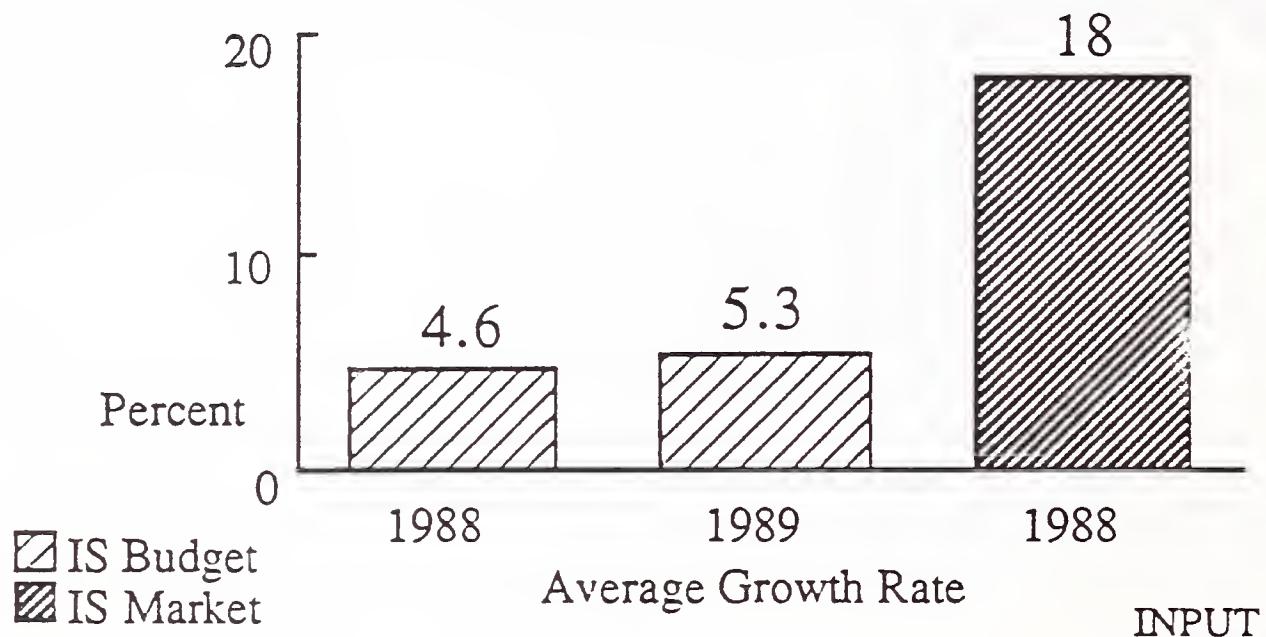
NOTES:

JJ88-DT2-26

INP

Information Systems Budget

(Percent)

Category	'87	'88	'88	'89
	(Dist'n)		(Growth)	
Personnel	40	39	2	2
Computer Hardware	28	28	5	4
Communications	11	12	14	6
Ext. Prod. & Svcs.	16	16	5	2
Other	5	5	4	0
Total	100	100	4.6	5.3

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NOTES:

JJ88-DT2-29

INPUT

Information Systems
Major Issues—1988

- Rising Management Expectations

- User Demands for Increasingly Complex Solution

- Managing the Technology Investment

- Integration of Data/Technology/ Applications

- Delivery of "Mission Critical" Systems

INPUT

NOTES:

JJ88-DT2-7a,b

INF

Application
Development Tools

NOTES:

JJ88-DT2-10

Application Development—Backlog
1987 versus 1988
Budget & Issue Survey

Decreased

Increased

18%

42%

40%

Unchanged

INPUT

NOTES:

JJ88-DT2-11

IN
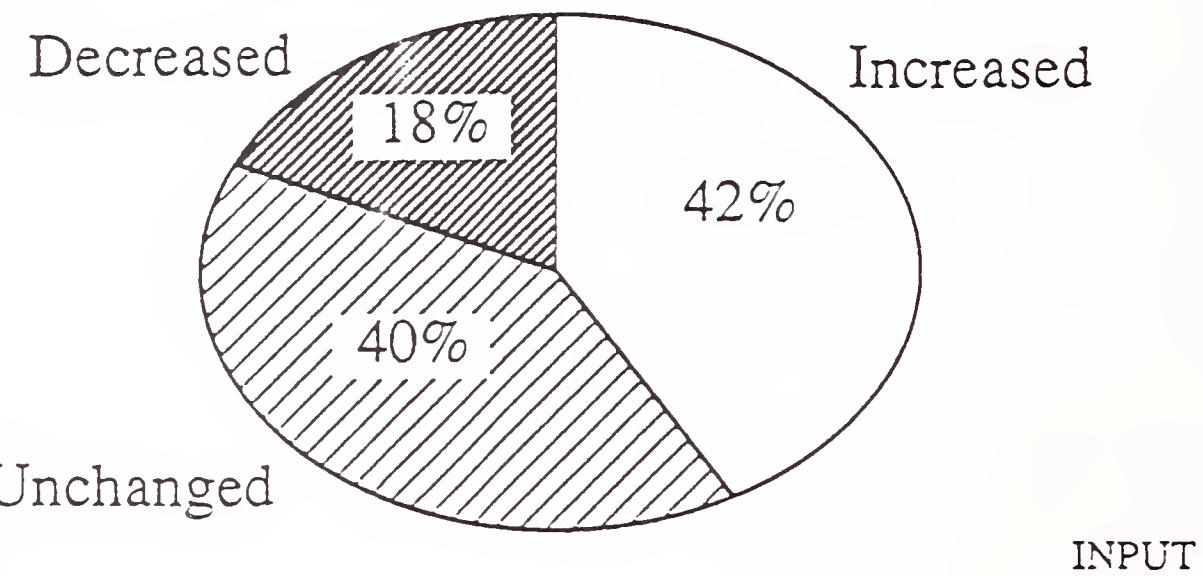
Application Development—
Key Issues

Issue	Resp.
Productivity & Quality	38
Use of Technology	16
Responsiveness	14
Development Process	11

NOTES:

JJ88-DT2-12a

Development by the End User

	Percent of Respondents
Production Systems	52
Personal Only	48
Mainframe	50
Mini	33
PC	78

☐ Activity Level
☑ Location

INPUT

NOTES:

INI
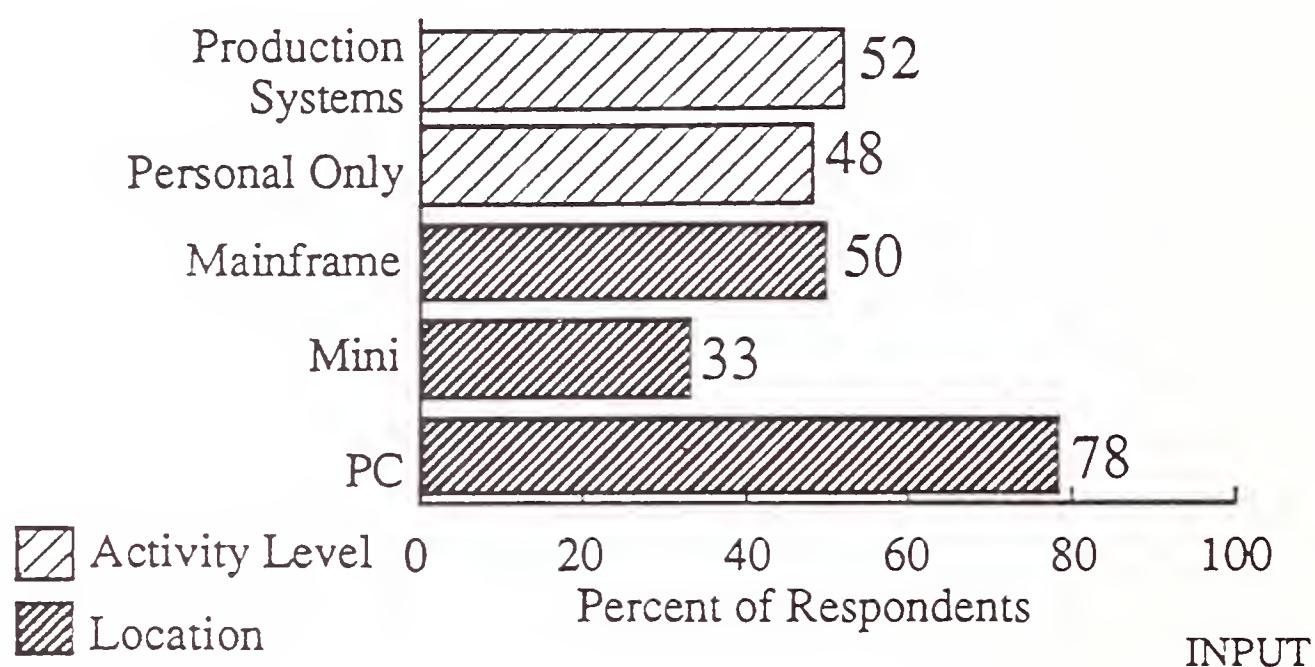
Applications Development Summary

- Backlog Will Never Go Away

- External Resources Becoming More Common

INPUT

NOTES:

JJ88-DT2-21a

INPUT

Applications Development Summary

- End User Becoming a Force and Alternative

- Relational DBMS Use in Full Bloom

- Data Management Will Have to Change

NOTES:

JJ88-DT2-21b

User Research Findings
Round Table Session

- Data Management: Current Trends and Challenges

- Systems Integration: Buyer Issues

- Workstation Strategies

- Information Systems Budget

INPUT

NOTES:

JJ88-DT2-42

INPUT

Information Services Industry Structure

```
                    ┌──────────┐
                    │  Total   │
                    │ Industry │
                    └──────────┘
┌ Applications      ┌ Systems           ┌ Professional
  Software            Integration         Services

┌ Systems           ┌ Processing        └ Customer
  Software            Services             Support

└ Turnkey           └ Network
  Systems             Services
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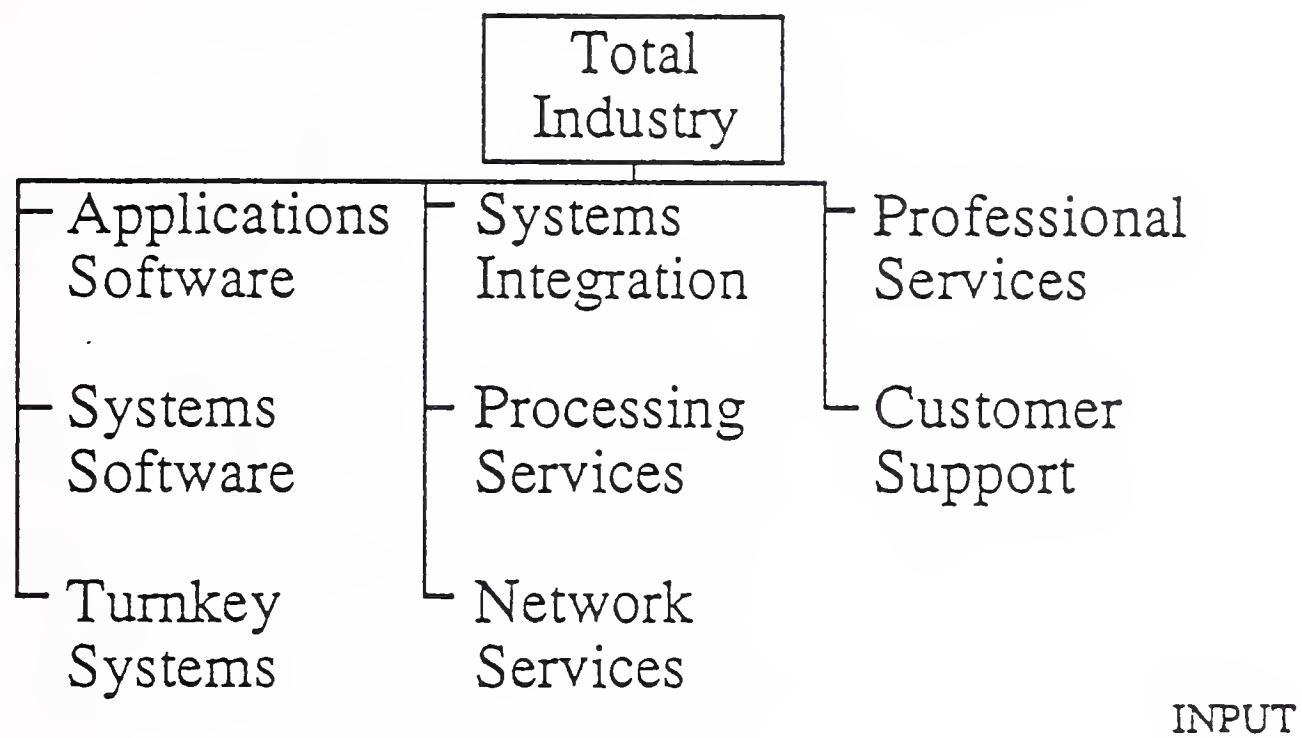
NOTES:

JJ88-RG1-10

Delivery Mode Expansion

1986		1987

Processing/Network Services ──────→ Processing
                          └────→ Network

Professional Services ──────→ Professional Services
                     └────→ Systems Integration

INPUT

NOTES:

Delivery Mode Expansion

<u>1986</u>		<u>1987</u>
Applications Software	⟶	Unchanged
Systems Software	⟶	Unchanged
Turnkey Systems	⟶	Unchanged
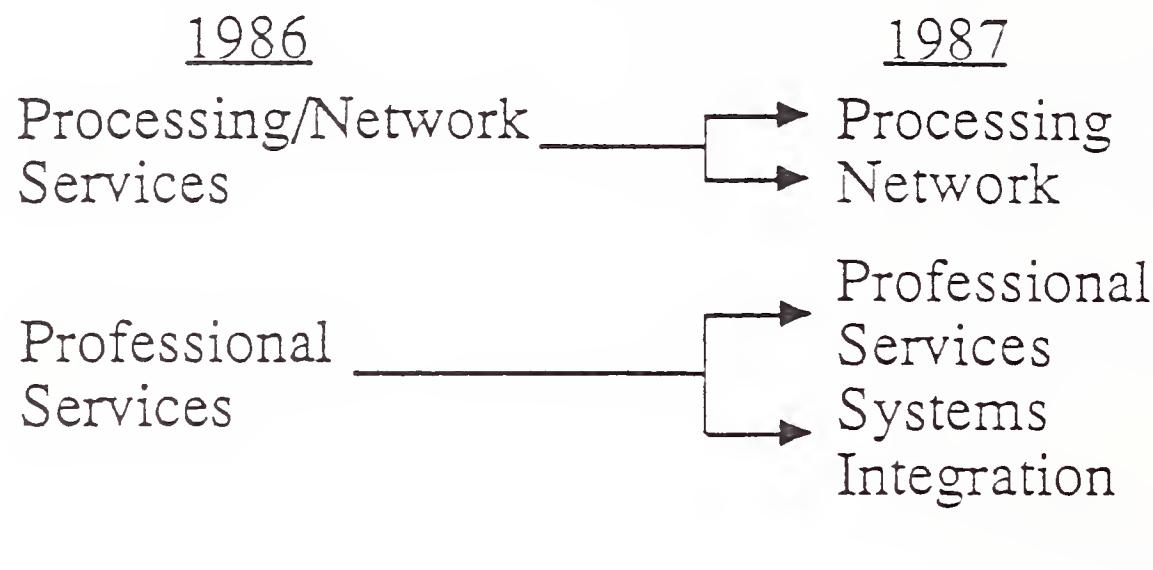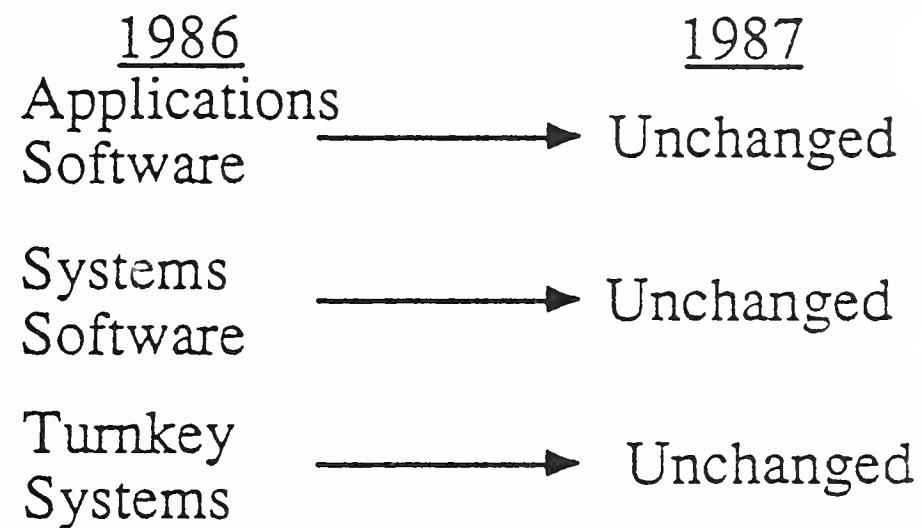
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NOTES:

JJ88-RG1-11 B

Vertical/Cross-Industry Markets

- "Office Systems" Category Added

- 6 Delivery Modes Forecast for
  Each Vertical/Cross-Industry Market

- Subcategories for Selected Verticals

Banking	Manufacturing
- Commercial Banks	- CAD/CAE
- Savings/Thrifts	- Manufacturing
- Brokerage	Control
- Other	

INPUT

NOTES:

Information Services
Industry Trends

NOTES:

Key Trends for the 1990s

- Products & Services Markets Blurring

- Changing Market Structure

- Internationalization

- Standards

- Vendor Reactions

INPUT

NOTES:

JJ88-DW1-12

IN

Products & Services Blurring

Traditional Competitors Are Changing:

- Traditional <u>Product</u> Companies Adding Services

- Traditional <u>Service</u> Companies Adding Products
  (Arthur Andersen, Peat Marwick)

New Competitors Emerge with "Solution Services"

- McKesson

- AMR

INPUT

NOTES:

JJ88-DW1-13A,B

INPUT

"Blurring" of Offerings Reflects
Changing Market Structure/Demand

- <u>Systems Integration</u> Continues to Emerge

- <u>EDI</u> Incorporates Multiple Products/Services

- New Technologies Will Spawn Additional Change
    - Image
    - Integrated Voice/Data
    - High-Performance Digital
      Communications

INPUT

NOTES:

JJ88-DW1-15A.B

IS Market Structure—1980s
INPUT's View

Software

Processing
Services

Professional
Services

Turnkey
Systems

Network
Services
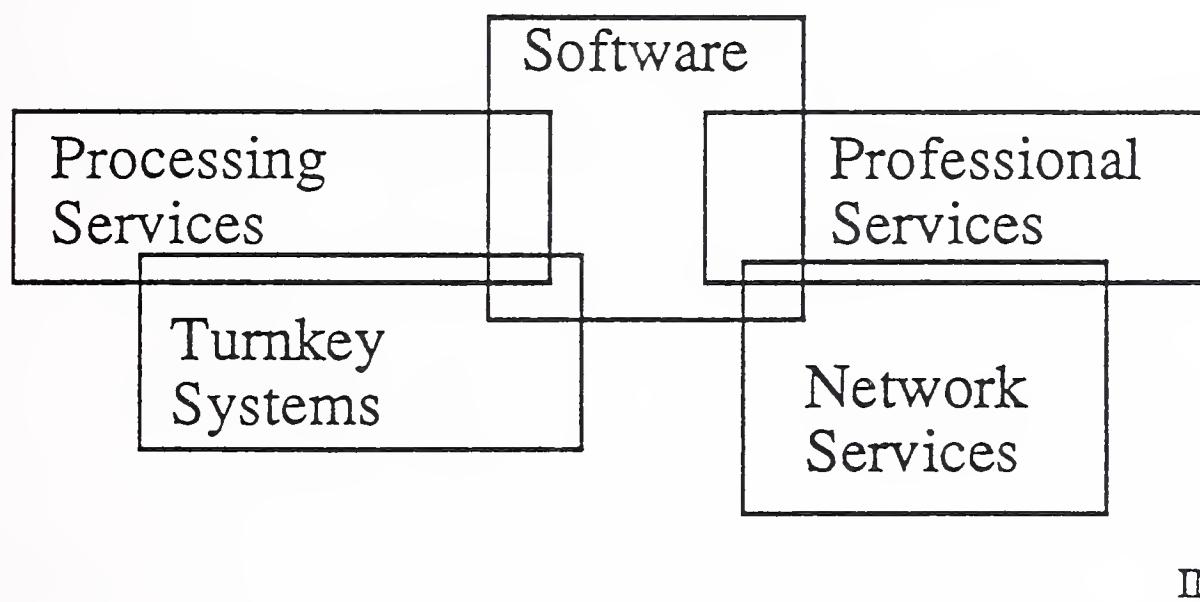
INPUT

NOTES:

INPUT

IS Market Structure—1990s
A Different View

Software

Processing
Services

Integrated
Solutions

Professional
Services

Turnkey
Systems

Network
Services

NOTES:

JJ88-DW1-17

IN
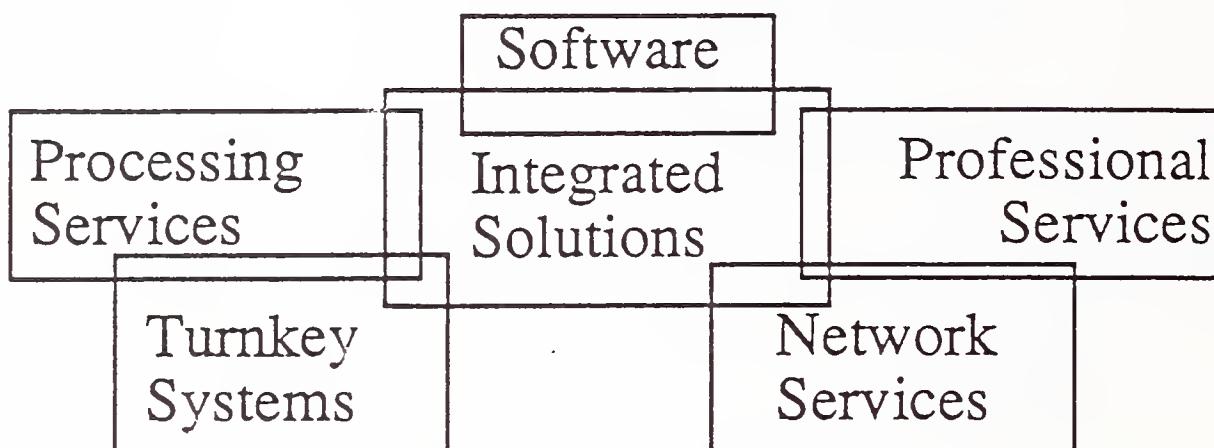
IS Market Structure—1990s
Emphasis on Supporting Services

Software

Processing Services

Integrated Solutions

Professional Services

Turnkey Systems

Network Services

Supporting Services
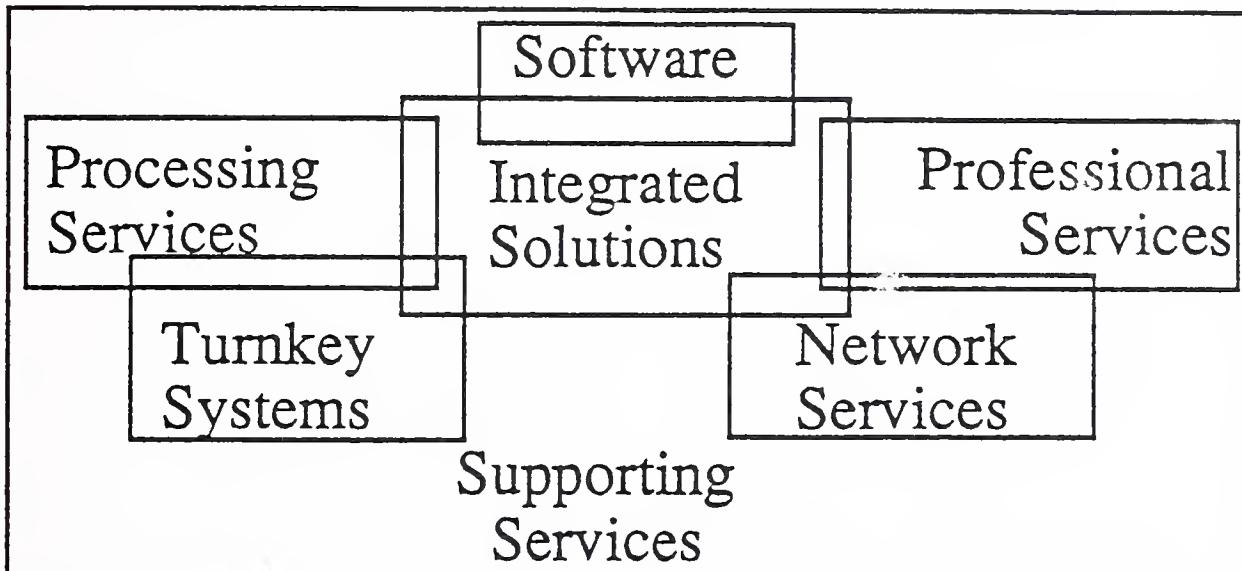
NOTES:

JJ88-DW1-18

Internationalization
A Dominant Trend in the '90s

- Collapsing Market Barriers
  - Europe
  - North America
- Growing Market Interest/Participation
  - Pacific Rim
- Internationalization of Buyer Requirements

INPUT

NOTES:

JJ88-DW1-19

Internationalization

- Computer Manufacturers Ahead Now

- Information Services Companies
  Falling Behind

- Competition Coming:
  - Cap Gemini
  - Sema - Cap
  - SDL Scicon

INPUT

NOTES:

JJ88-DW1-20

INPUT

Standards

Driven by:
- Internationalization
- Buyer's Integration Requirements
- Dominant Providers/Coalitions

Focused on:
- Bridging the Technical Interface
- Rationalizing the Human Interface
  HUMATICS ™

INPUT

NOTES:

JJ88-DW1-21

Standards in the 1990s

Rationalization — <u>Not</u> Unification

Software — <u>Not</u> Hardware Driven

NOTES:

JJ88-DW1-22

Vendor Reactions

INPUT

NOTES:

Summing It Up

- Broadening Product Strategies

- Emphasis on "Solution" Niches

- Focus on Quality & Service

Accomplished through:
- Self-Funded Expansion

- Consolidation—Partnering/Acquisitions

NOTES:

JJ88-DW1-24

Current Examples Portend
1990s Trends

- IBM

- Oracle

- Arthur Andersen

- Computer Associates

- Digital Equipment

NOTES:

Oracle as an Example

Systems Software
RDBMS

Professional
Services

Applications
Software

Systems
Integrator

CASE
Financials
Office
Automation

INPUT

NOTES:

INPUT

Arthur Andersen

| Management Consulting |
| Software Development |

→ Software Products ———— • Mac-Pac
→ Education ———————————— • Foundation
→ Systems Integration ——— • DCS
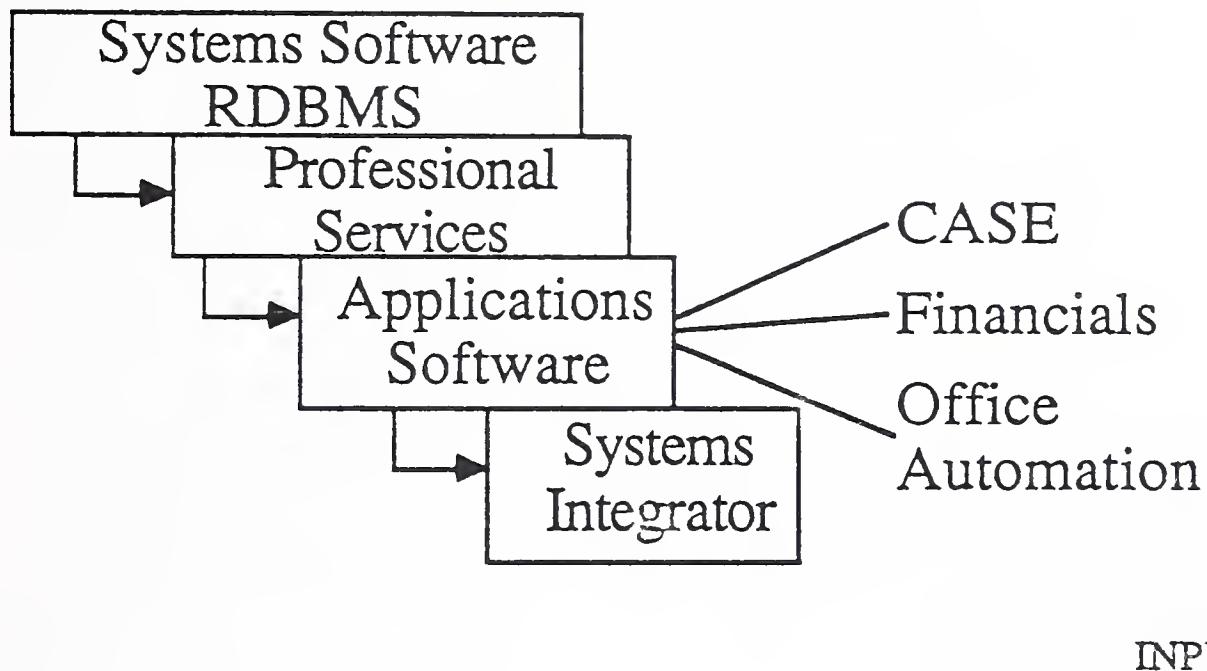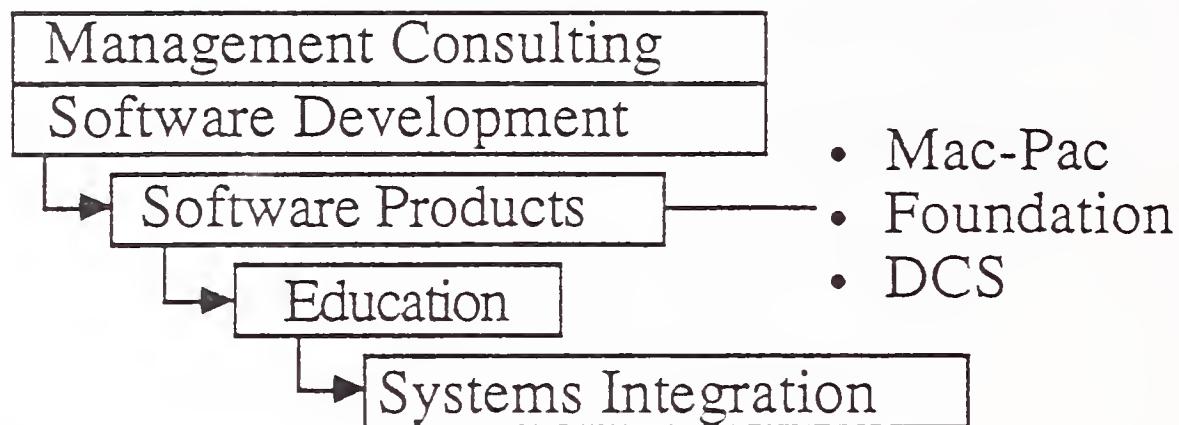
$1.4 Billion
13,000 Professionals

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NOTES:

JJ88-DW1-27

Digital Equipment

Software Products

→ Professional Services

→ Systems Integration

Enterprise Services

Alliances (Apple & CIM)
Network Systems
Architecture
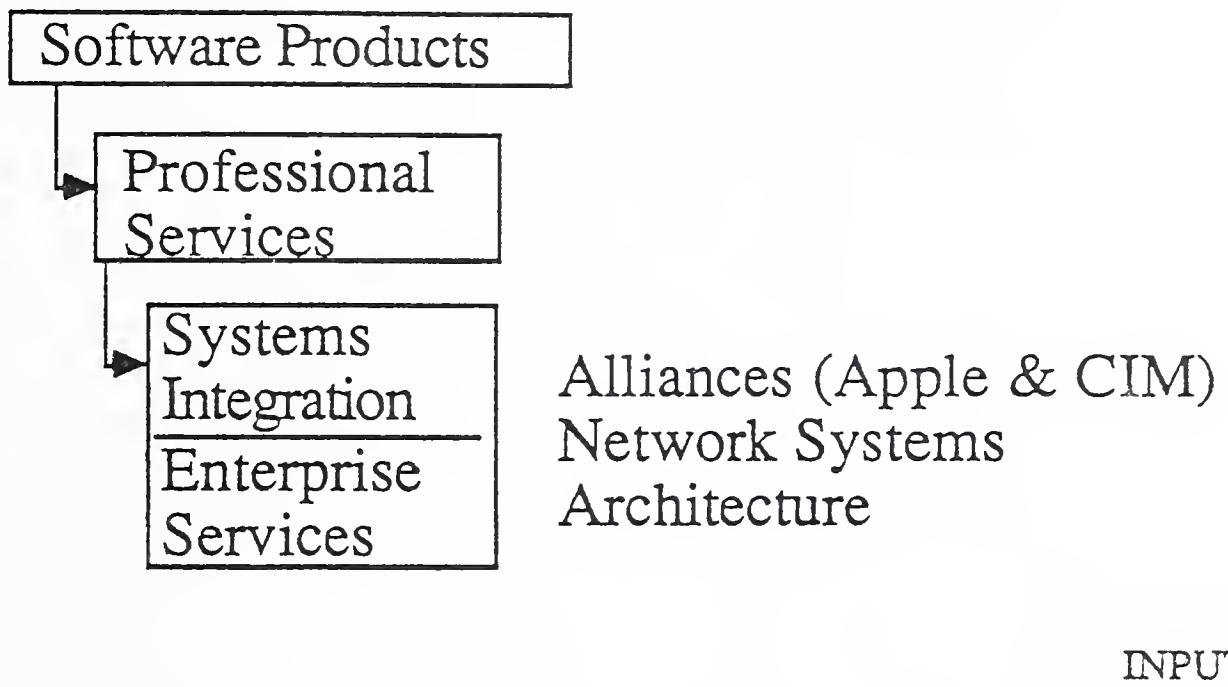
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NOTES:

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Computer Associates

- Largest Software Merger - UCCEL
- Pursued Cullinet
- Made Offer for MSA
- Strategy—Growth by Acquisition
- Porting Products to DEC and Others
- Alliance with UNISYS

INPUT

NOTES:

JJ88-DW1-28

Consolidation in the Industry
A Dominant Industry Phenomenon in the 1990s:

- A Smaller Number of Larger Vendors
- Providing a Broader Range of Integrated Offerings
- Supported by Smaller Niche Vendors
- Targeted at Providing Solutions

INPUT

NOTES:

JJ88-DW1-30

INPUT

Alliances

- Digital/Apple
- Ashton-Tate/Microsoft/SYBASE
- Relational Technology/
  Computer Task Group
- CAI/UNISYS
- IBM/Metaphor (Equity)
- CASE (Numerous)

NOTES:

JJ88-DW1-33

Conclusions

- End-Users Will Control the Major Purchase Decisions

- Systems Integration Expands as Solutions Grow in Complexity

- Internationalism Is Here

- Technology Continues to Create Opportunities

INPUT

NOTES:

JJ88-DW1-34

INPUT

Conclusions

- Shorter Lifecycle Calls for Fast Response
- Vendor Versatility a Key to Growth
- Everybody Needs Strategic Partners
- Services (People) Will Be the Key
  - Recruiting   - Motivation
  - Compensation   - Training

INPUT

NOTES:

JJ88-DW1-35

INI

Information Services
Industry Forecast

INPUT

NOTES:

JJ88-RDW-1

Information Services Markets
by Mode of Service—1987

Professional Services 21%

Processing Services 24%

Network Services 8%

Turnkey Systems 13%

Systems Integration 5%

Systems Software 14%

Applications Software 15%

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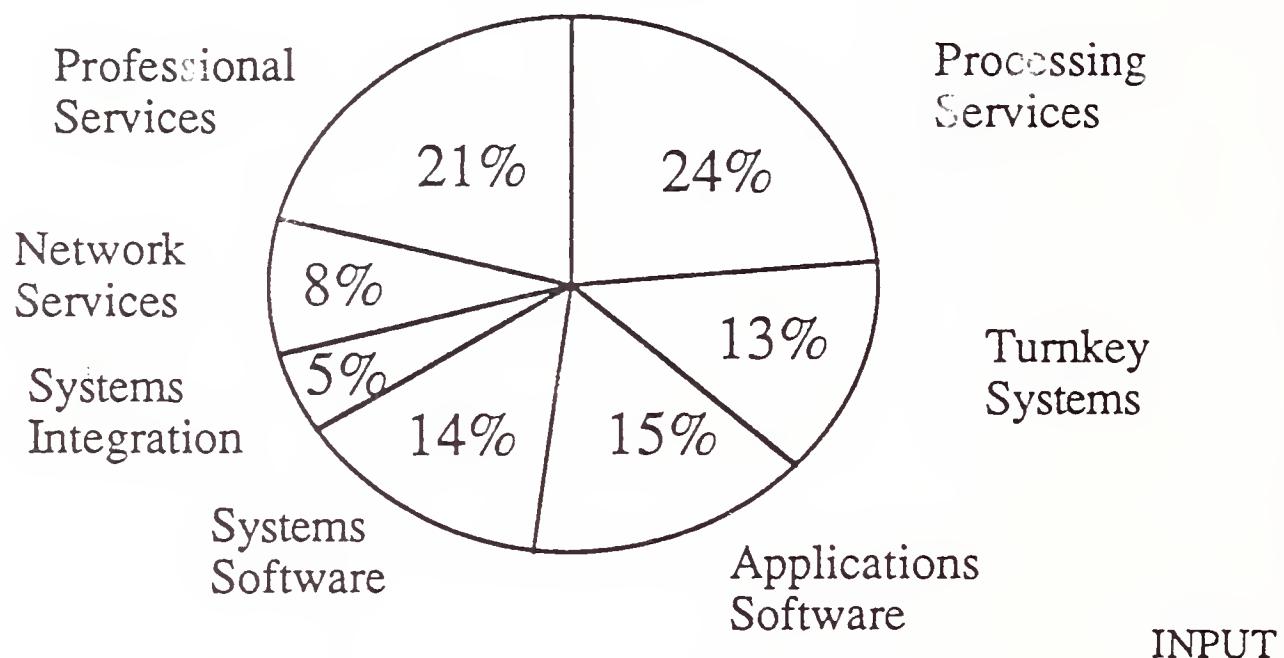
NOTES:

Projected Information Services Markets by Mode of Service—1993
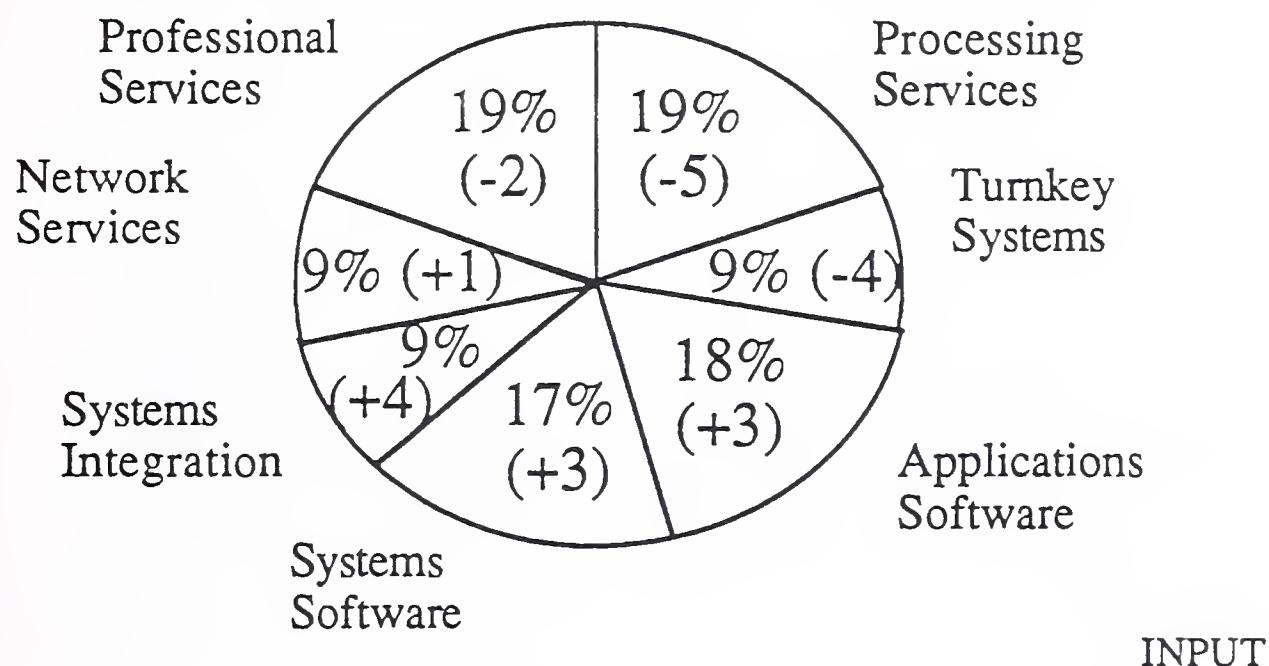
Professional Services

Network Services

Systems Integration

Systems Software

Processing Services

Turnkey Systems

Applications Software

19% (-2)

19% (-5)

9% (+1)

9% (-4)

9% (+4)

17% (+3)

18% (+3)

INPUT

NOTES:

JJ88-RDW-3a

INPUT

Information Services Industry Forecast by Delivery Modes,1988-1993

AAGR

| | 12% | | 17% | | 20% | 62.2 |

($B) User Expenditures

☑ 1988
▨ 1993

Processing Services — 18.8, 32.9
Professional Services — 15.1, 33.5
Software Products — 25.1, 62.2

INPUT
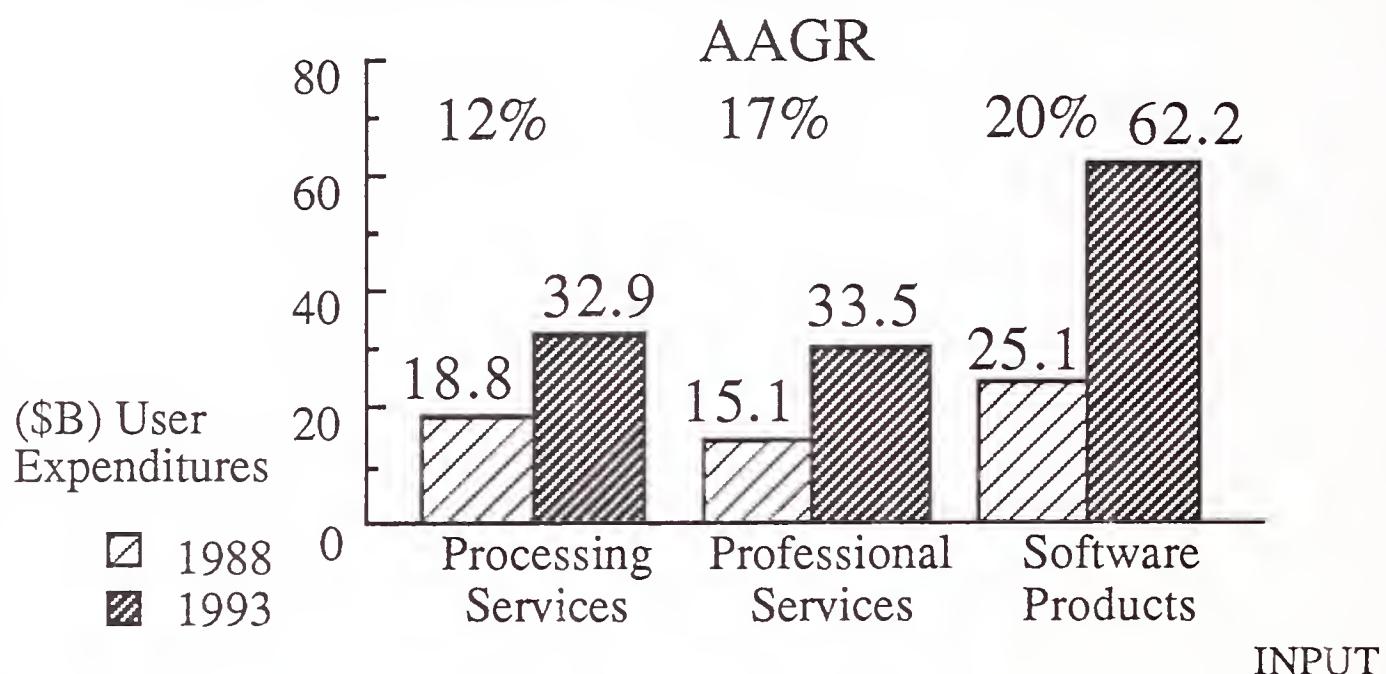
NOTES:

MAAP-39

Information Services Industry Forecast by Delivery Modes, 1988-1993
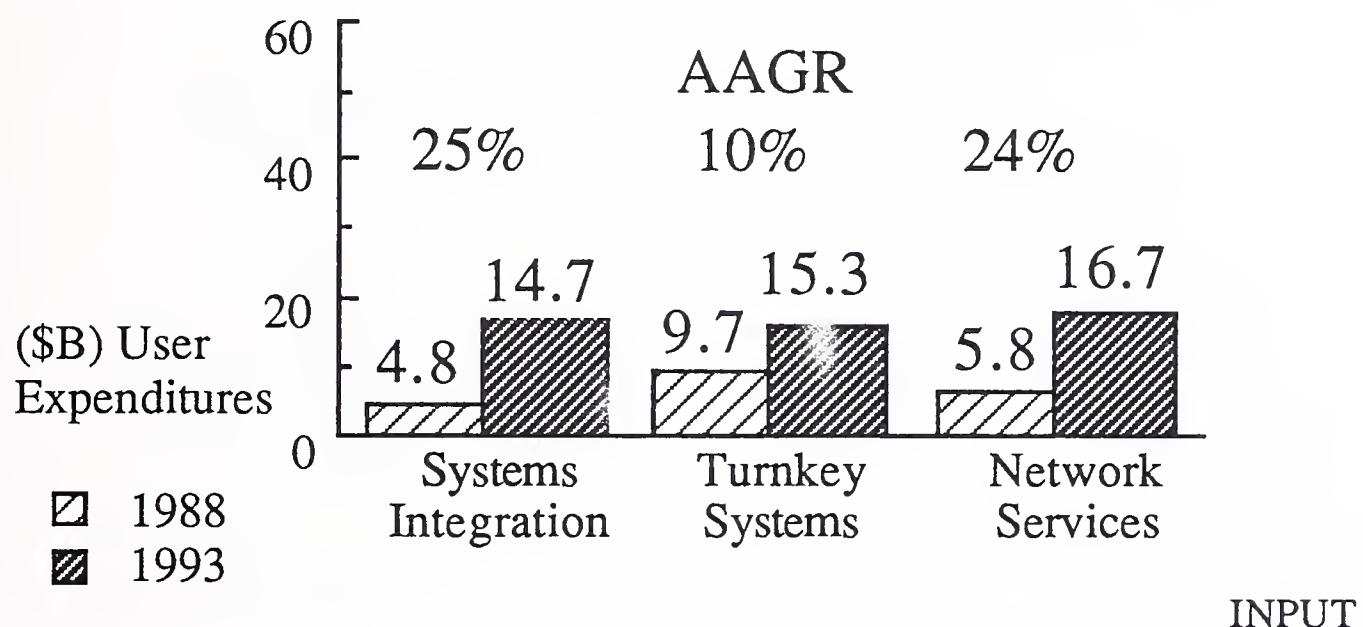
AAGR

	Systems Integration	Turnkey Systems	Network Services
AAGR	25%	10%	24%
1988	4.8	9.7	5.8
1993	14.7	15.3	16.7

($B) User Expenditures

☑ 1988
▨ 1993

INPUT

NOTES:

MAAP-40

INPUT

Incremental Industry Expenditures by Delivery Mode, 1988-1993

Delivery Mode	$B Added Over 5-Yr Period
Total Software	38
- Systems	20
- Software	18
Professional Services	18
Processing Services	14

INPUT

NOTES:

JJ88-RDW-7a

Information Services Leading Vendors

Vendors	1987 U.S. Revenues ($M)
IBM	4,841
ADP	1,384
EDS	1,296
DEC	1,138
UNISYS	1,035
CSC	960

Top Ten Vendors=21% of Industry Total

INPUT

NOTES:

JJ88-RDW-8a

INPUT

Incremental Industry Expenditures by Delivery Mode, 1988-1993

Delivery Mode	$B Added Over 5-Yr Period
Network Services	12
Systems Integration	11
Turnkey Systems	6
Total	99

NOTES:

JJ88-RDW-7b

Information Services Leading Vendors

Vendors	1987 U.S. Revenues ($M)
McDonnell Douglas	852
CDC	840
Arthur Anderson	806
TRW	651

Top Ten Vendors=21% of Industry Total

INPUT

NOTES:

JJ88-RDW-8b

INPUT

Information Services Leading "Pure IS" Vendors

Vendors	1987 U.S. Revenues ($M)
ADP	1,384
EDS	1,296
CSC	960
Intergraph	641
Lotus	395
Shared Medical	391

INPUT

NOTES:

JJ88-RDW-9a

Information Services Leading "Pure IS" Vendors

Vendors	1987 U.S. Revenues ($M)
Computer Associates	389
BDM Int'l	307
Microsoft	239
Compugraphics	220
MSA	199

INPUT

NOTES:

JJ88-RDW-9b

INPUT

Software Products

Systems Software	Applications Software
• Mainframe	• Mainframe
• Mini	• Mini
• Micro/Workstation	• Micro/Workstation

NOTES:

MAAP-1a

Software Products

NOTES:

JJ88-DW2-1

User Needs

- Application Sophistication
- Heterogeneous Hardware/Environment
- Dynamic Connectivity/Cooperative Processing
- Resource Sharing/Groupware
- Productivity: User and Programming
- Workstation Support
- Image Processing

INPUT

NOTES:

JJ88-DW2-3

Technology Impacts

- New Platforms/Devices
  - AS/400, PS/2, Parallel Processors, Supercomputers

- Networking/LANs

- Improved Resources
  - Memory, Storage, MIPS

- On-Line Transaction Processing

INPUT

NOTES:

JJ88-DW2-4a

Technology Impacts

- Operating Systems
  - UNIX, Pick, OS/2, MS/DOS
- Server/Client Relationships
- Cooperative Processing

NOTES:

JJ88-DW2-4b

INPUT

Business Environment

- Standards

- Taxation

- Object Code: Source Code

- Licensing

- Lawsuits

- Cooperation

- Market Mix

NOTES:

JJ88-DW2-6

Market Forecast

NOTES:

JJ88-DW2-7

Software Product Expenditures 1998-1993
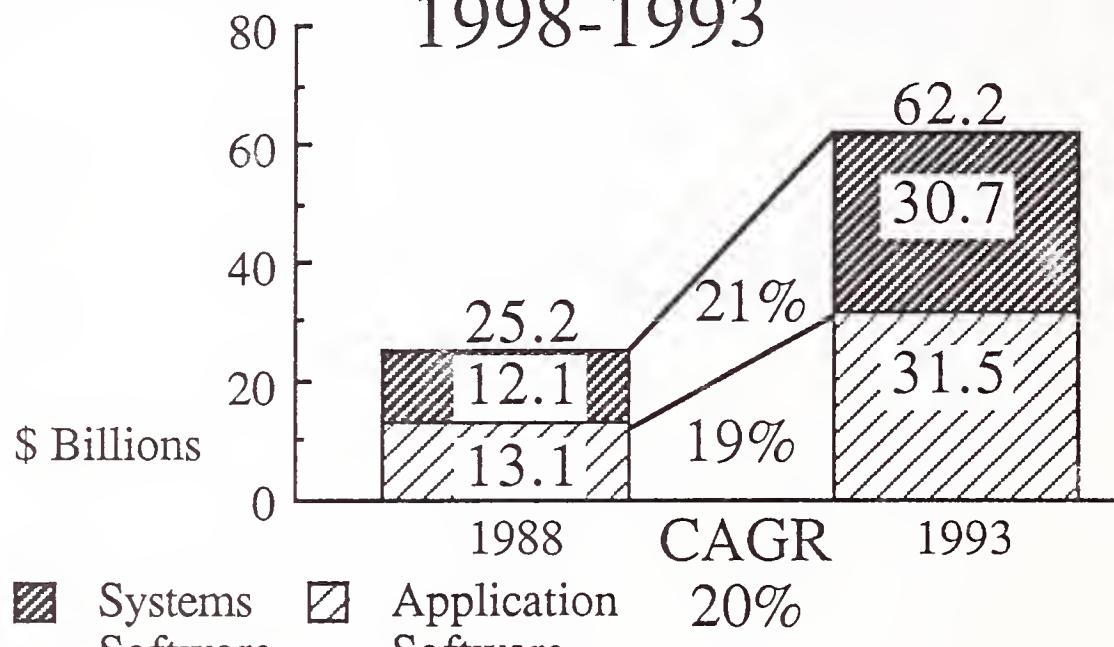
NOTES:

Total Software Products Market Forecast by Platform Type 1988-1993

	CAGR
Mainframe 10.1 / 18.5	13%
Mini 7.9 / 16.9	16%
Micro 7.2 / 26.8	30%

0   10   20   30   40

▨ 1988
▨ 1993 $ Billions

INPUT

NOTES:

MAAP-13

INPUT
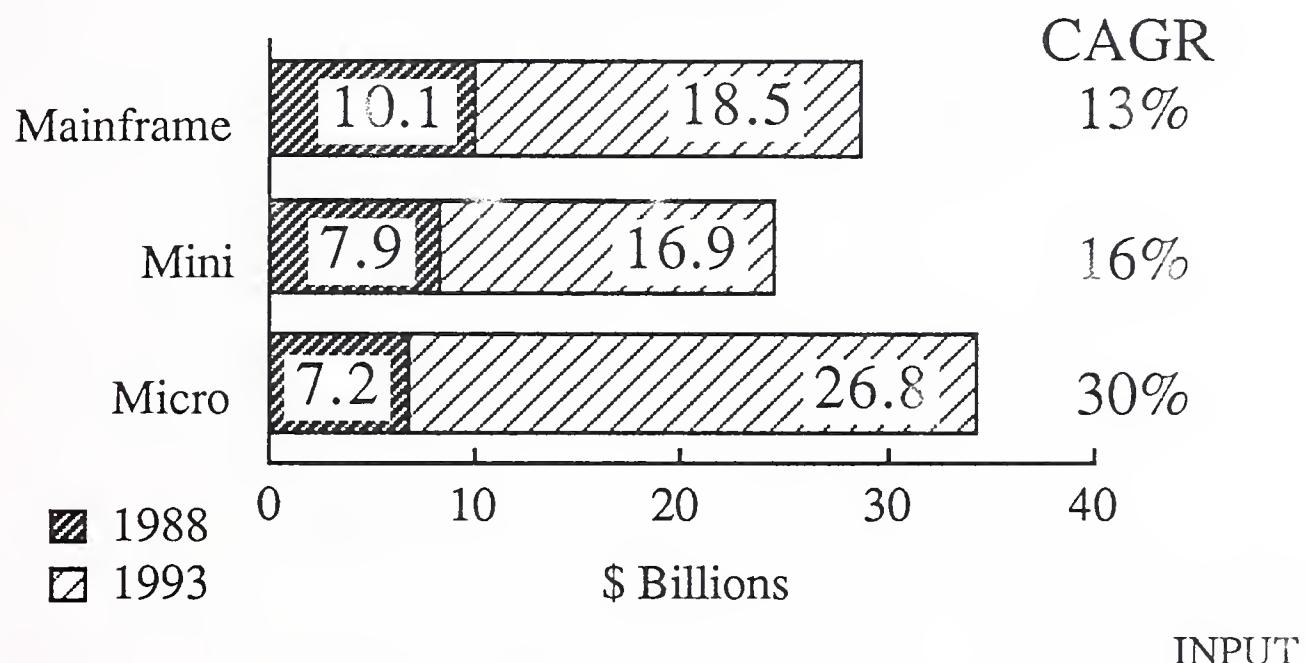
Applications Software Market Submodes 1988-1993

User Expenditures
($ Billions)
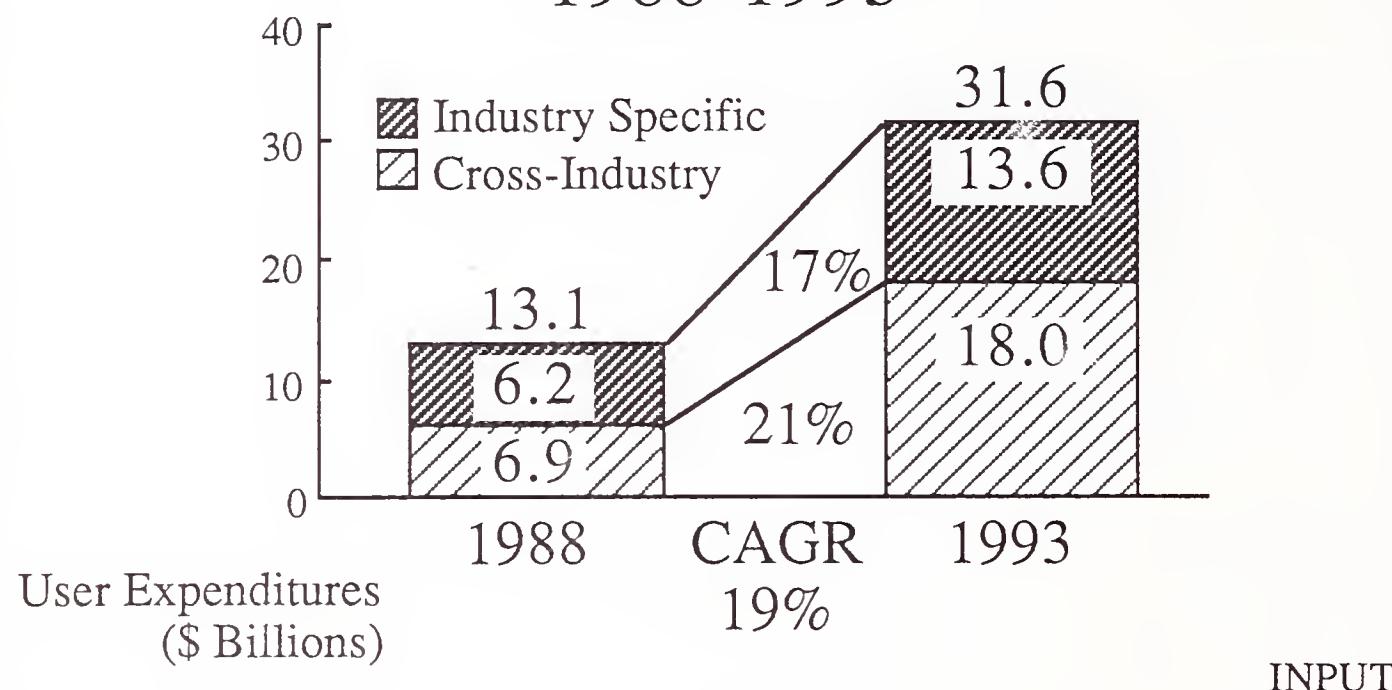
NOTES:

MAAP-4

Applications Software Products Market— Driving Forces

- CPU Population Growth

- Standards

- Workstation Power

- Industry-Specific Thrusts

- EIS/Other Emerging Niches

- Application Complexity

INPUT

NOTES:

MAAP-5ab

INPUT

Systems Software Products Market—Driving Forces

- Staging for New Applications Software Growth

- Data Center Management Tools

- RDMS

- SAA

NOTES:

MAAP-11a

Systems Software Products Market— Driving Forces

- Cooperative Processing

- Image Processing

- CASE/4GL

- Standards (SQL/UNIX)

- Consolidation

INPUT

NOTES:

MAAP-11b

IBM Actions
-Major-

- New Line of Business:
  Applications Solutions

- AS/400 Midrange System
  - 1st SAA Announcement
  - Software Announcement
  - Applications

NOTES:

JJ88-DW2-25a

IBM Actions
-Major-

- OS/2 and OS/2E

- Applications Systems Division (ASD)
  - Started Summer of 1987
  - AS/400 Announcement
  - Internal and External Responsibility

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NOTES:

JJ88-DW2-25b

INPUT

SAA

- Single Most Important Event Unfolding in Software Products Market

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NOTES:

JJ88-DW2-27b

SAA—What Is It?

Common Applications

Common Programming Interface
Application-Enabling Products

Common User Access

Common Communications Support

Communications

| PC | S/3X Operating System | S/370 |
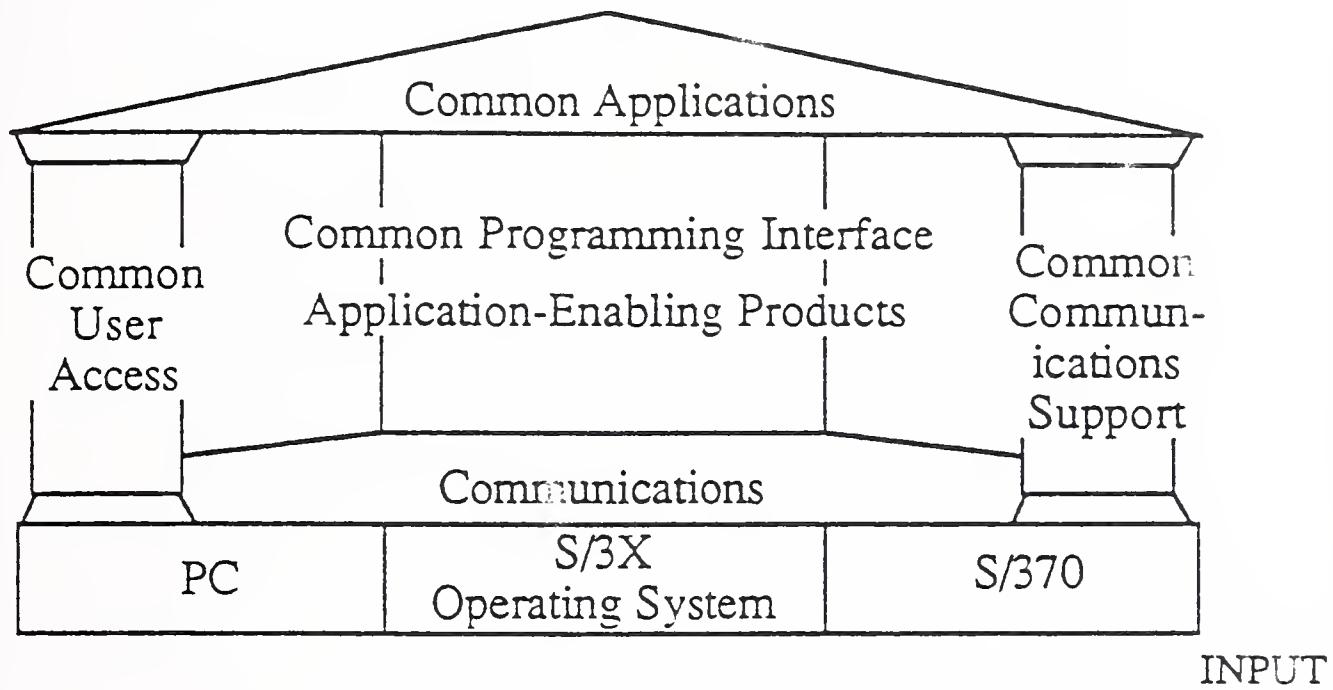
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NOTES:

JJ88-DW2-28

SAA—Issues

- Impact on Software Industry
- User Acceptance/Benefits
- Impact of ASD
- Marketing Hype?
- Capability Shortfalls
- Hardware Independence

INPUT

NOTES:

JJ88-DW2-29

IN

SAA—When?

Official Announcement	3/17/87
Marketing Efforts	Continuous

Hardware Platforms

PS/2: O/S 1.1	3Q88
S/3X (AS/400)	2Q88
S/370	4Q89*
S/? (Next System)	4Q90*

* INPUT Estimate

NOTES:

JJ88-DW2-31

SAA—Applications Revenue

SAA Applications ($ Billions)

Applications Software

SAA Software

1988 1989 1990 1991 1992 1993 1994 1995
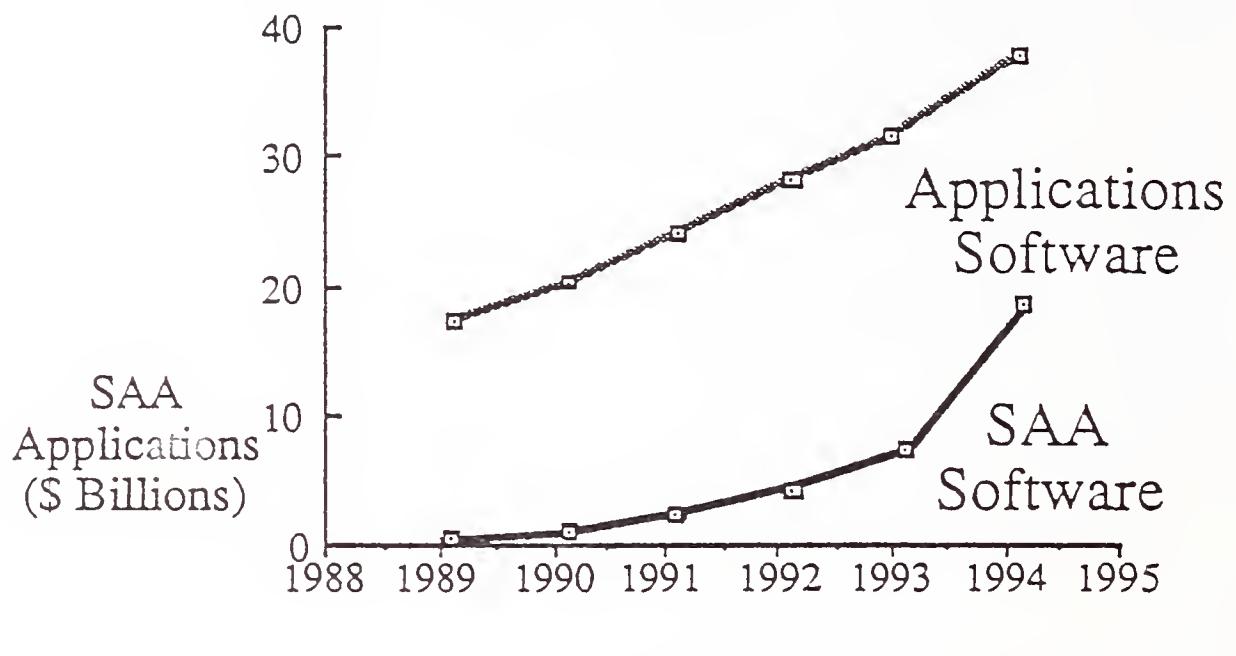
NOTES:

JJ88-DW2-32b

SAA—Conclusions

SAA Will:

- Drive Product Consolidation

- Be a User Requirement

- Drive New Applications/Products

- Drive Software Pricing

- Reshape the Software Industry

INPUT

NOTES:

JJ88-DW2-33

Open Software Foundation
-Formation-

<u>Background</u>

- Sun/AT&T Form Strategic Relationship
- Other UNIX-Oriented Vendors Band Together

INPUT

NOTES:

JJ88-DW2-35a

Open Software Foundation
-Formation-

Result

- Not-for-Profit Group
- Seven Original Founders
  - Apollo, Groupe-Bull, DEC, HP, IBM, Nixdorf, Siemens
- $13.5M over 3 Years for Sponsors
- $25K/Year for Associates

NOTES:

JJ88-DW2-35b

Open Software Foundation

- Rival Group: Archer
  - AT&T
  - Sun
  - UNISYS
  - NCR

- Two UNIX Standards Could Develop

NOTES:

MAAP-16

Mergers/Acquisitions

- Broadview Analysis for 1987
  - 358 Deals—Up 17%
  - $4.9 Billion
  - Largest CAI/UCCEL @ $830 Million

- ADAPSO/Broadview Index
  - 1st Half 1988
  - 190 Deals
  - $5.4 Billion

INPUT

NOTES:

JJ88-DW2-38

INPUT

Mergers/Acquisitions
-Examples-

- Informix/Innovative
  DBMS   Office Automation

- IBM/Spectrum
  Mfg.   Network Mgmt.

- Ashton-Tate/Ann Arbor Softworks
  PC Software   Desktop Publishing

- Software Publishing/Office Solutions
  PC Software   Word Processing

INPUT

NOTES:

JJ88-DW2-39a

IN

Mergers/Acquisitions
-Examples-

- 3Com/Communications Solutions
  LAN   Communications

- Apple/Orion Network Systems
       /Network Innovations
  Mfg.   Communications

- Nynex/AGS Computers
  RBOC   Prof. & Software

INPUT

NOTES:

JJ88-DW2-39b

Alliances

- CASE Vendors
  - Front-End/Back-End

- Relational Technology/Computer Task Group
  /Westinghouse

- Cullinet/SHL Systemhouse

NOTES:

JJ88-DW2-40a

Alliances

- CAI/Unisys

- Sybase/Neuron, National InfoSys, SPSS, V.I. Corp.

- Ashton-Tate/Microsoft/Sybase

- DEC/Apple
  Network Innovations — Oracle
  Sybase

INPUT

NOTES:

JJ88-DW2-40b

INPUT

New/Hot Areas

- CASE
- AI—Rejuvenated
- Data Center Management
- UNIX—All Functionality
- Image Processing
- DSS/EIS

NOTES:

JJ88-DW2-41

AI—Revisited & Rejuvenated

- New Players
  - Neuron Data, Natural Language

- Old Players
  - Teknowledge—Withdraws Direct Marketing
  - Language Group—Niche Oriented
  - Intellicorp—Major Agreement with IBM

INPUT

NOTES:

JJ88-DW2-42a

AI—Revisited & Rejuvenated

- Front-End Applications
  e.g., ADR's—Mindover
  Verity—Text Retrieval
  etc. . .

INPUT

NOTES:

JJ88-DW2-42b

IN

Fast-Growing Software Vendor—Oracle

- Core Business: RDBMS

- New Emerging Areas:
    - Professional Services
    - Financial Products
    - Office Automation*
    - Systems Integration
    - Education and Training
    - VAR Channels

    * Not Yet Announced

INPUT

NOTES:

JJ88-DW2-43

INPUT

CASE
(Computer-Assisted Systems Engineering)

Market and Opportunity
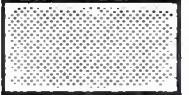
NOTES:

JJ88-DT4-1

CASE Opportunity
Software Crisis

Software Development

Systems
Software

Applications
Software

In-House		Products	
Small	Large	Small	Large
Small	Large	Small	Large
▒▒▒▒			

NOTES:

JJ88-DT4-5

Development Lifecycle
The CASE Opportunity

Requirements

| Analysis |
| Functional Specification |
| Design Specification |
| Coding & Test |
| System Integration |
| Release & Acceptance |
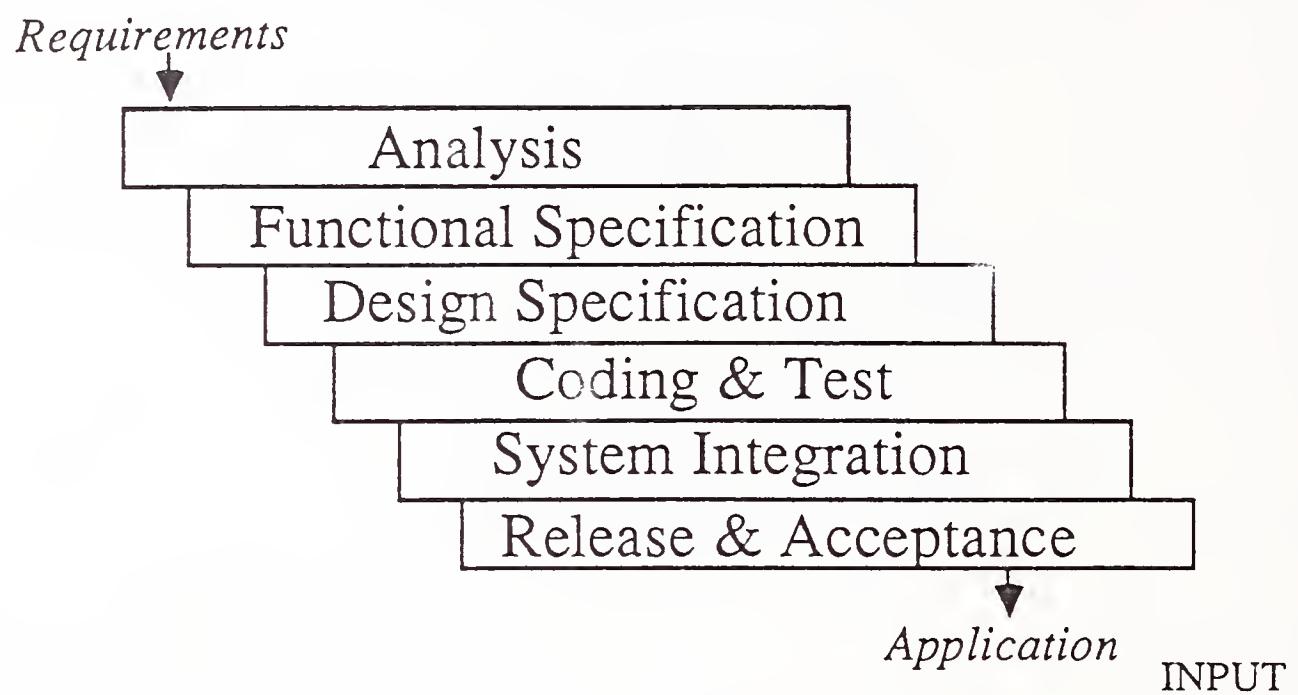
Application

INPUT

NOTES:

JJ88-DT4-6

CASE - User Perspective

- Backlog Problem Not Improving

- Productivity Problem Real

- Concern About Discipline Requirements

- Cautious About CASE

INPUT

NOTES:

JJ88-DT4-8

INPUT

Application Development Resources:
Allocation of Internal Resources
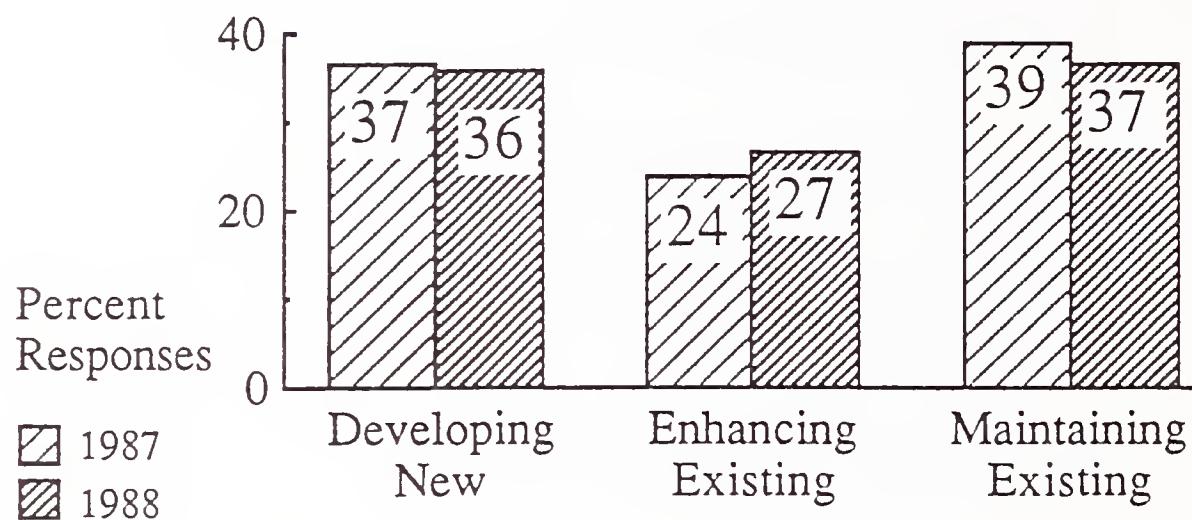
NOTES:

User Perspective
Activity with CASE
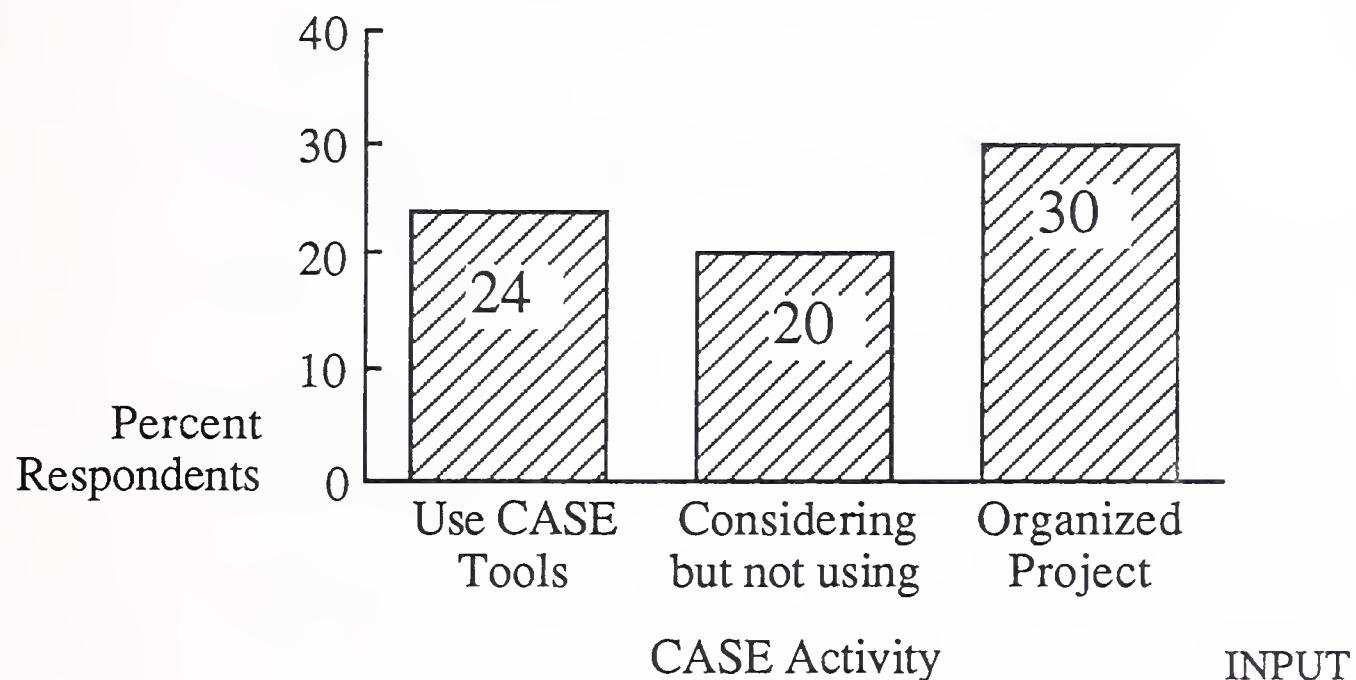
CASE—User Perspective Summary

- Real Productivity Problem

- Lingering Resistance to Disciplined
  Development Processes

- Two Problems
  - Existing Applications   - 2/3rds
  - New Development   - 1/3rd

- Slow to Become Systems Engineers

INPUT

NOTES:

JJ88-DT4-15A,B

IN

CASE Tools

New Development

Lifecycle Management	
Design	Code Generation
Documentation	

Maintenance

Translators Analyzers Comparators Restructurers
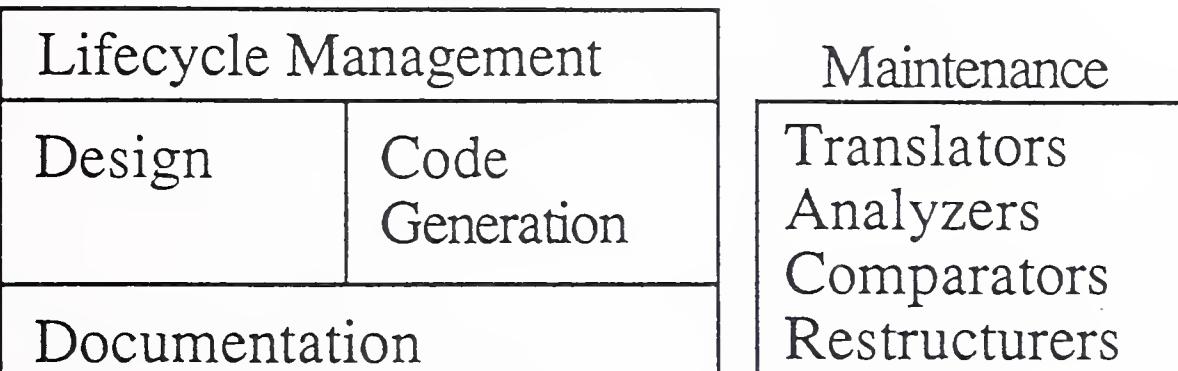
NOTES:

Market Status

- Remains in Emerging Phase
  - 3% to 5% Penetration
  - Rapid Growth - 100% a Year for 1985-87
  - No Dominant Vendors

- User Caution
  - Pilot Versus General Use
  - Wait and See Attitude

INPUT

NOTES:

JJ88-DT4-22

IN

Market Status

- Large Vendor Population
  - 40+ Active & 40+ Announced Vendors
  - Potential of Hundreds

- New Entries Likely
  - IBM—No Announced Product
  - 4GL & DBMS Vendors
  - Professional Services Vendors

INPUT

NOTES:

JJ88-DT4-24

INPUT

Vendor Alliances
Professional Services-
Front End

Arthur Young	KnowledgeWare
Coopers & Lybrand	NASTEC
Deloitte Haskins & Sells	Index Technology

INPUT

NOTES:

JJ88-DT4-29

CASE Market Forecast, 1987-1993
Front-End Usage Expenditures
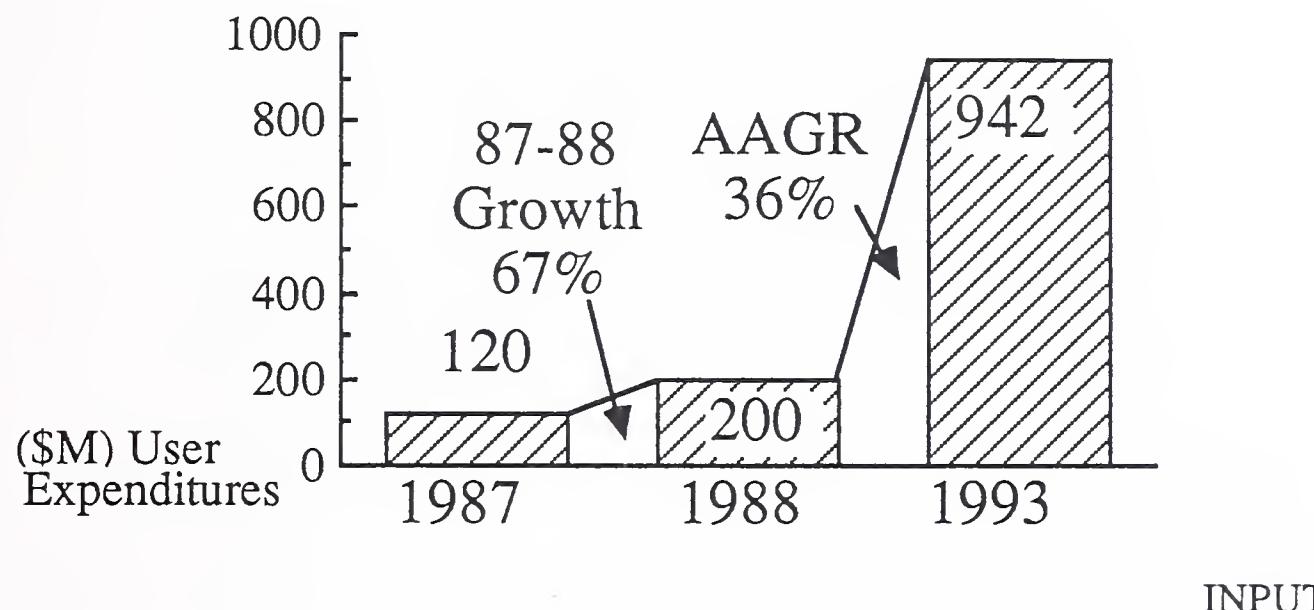
NOTES:

INPUT

Summary &
Conclusions

INPUT

NOTES:

JJ88-DW2-44

Software Vendor
Profile for Success

- Large Installed Base

- Heterogeneous Hardware Support

- Applications/Systems Product Basket

- Hardware Independence

- Strong Financial Resources

INPUT

NOTES:

JJ88-DW2-45

INPUT

Software Trends

- Traditional Vendors Reaching Out
  - Cullinet, McCormack & Dodge →VAX
  - CAI→VAX

- Professional Services Firms Enter
  - Arthur Andersen
  - Peat Marwick Main

INPUT

NOTES:

JJ88-DW2-46a

Software Trends

- Processing Services Firms Enter
  - GE

- Open Systems Architecture

NOTES:

JJ88-DW2-46b

Turnkey Systems/
VARs

Market Forecast &
Trends

NOTES:

JJ88-RG2-1

Turnkey Systems Market Structure

Turnkey Systems
- Equipment
- Packaged Software
- Customized Software
- Educ., Train., Prof., Serv.

Industry-Specific Sectors (15)
Cross-Industry Sectors (7)
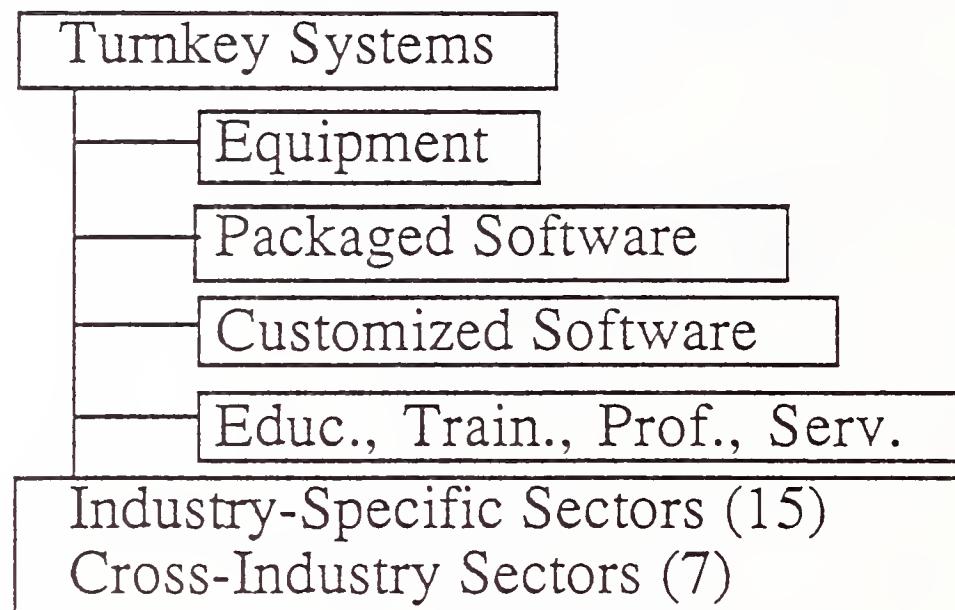
INPUT

NOTES:

JJ88-RG2-6

Differences Between System Integrators and Turnkey System Vendors

Systems Integrators	Turnkey Systems
Strategic Design & Consulting	Tactical Consulting
Multi-Year Effort	Single Year Time Span
High Level Complexity	Modest Complexity

INPUT

NOTES:

JJ88-RG2-5a

INPUT

Differences Between System Integrators and Turnkey System Vendors

Systems Integration	Turnkey Systems
SW Development	Software Products
High Cost	Moderate Cost
Large Project Management Skills	

INPUT

NOTES:

JJ88-RG2-5b

Similarities Between System Integrators and Turnkey Systems Vendors

Prime Contractors Role

Multiple Vendors Involved

Equipment Delivery

Software Customization

Installation, Training, and Support

Post-Installation Support

INPUT

NOTES:

JJ88-RG2-5c

INPUT

Selected Computer Systems Vendors Turnkey Products

- IBM's SolutionPacs

- IBM's AS/400 Office

- DEC's Solution Systems

- Unisys' Purchase of Convergent, a Leading VAR

INPUT

NOTES:

JJ88-RG2-10

Expanding Services

Provide New/Additional Services

- Consulting

- Customized Programming

- Additional Training/Education

- Data-Center Management

INPUT

NOTES:

JJ88-RG2-20

INPUT

Vendor Strategies

Increase Typical System Size/Price

- Enhance Product Offering

- Sell Larger Systems

Expand Industry Coverage

- Related Opportunities within
  Current Industry

- New/Additions Industry Markets

INPUT

NOTES:

JJ88-RG2-21

Vendor Strategies

Third-Party Application
Software Developers

- Cross-Matching
  - Complements VAR Product
  - Opens New Prospects

- Cross-Industry
  - Adds Value
  - Enhances Relationship

INPUT

NOTES:

JJ88-RG2-23

INPUT

Most Successful Applications Areas for Turnkey/VARs

- CAD/CAM/CAE

- Automotive Dealer and Distribution Systems

- Health Care/Medical Systems

- Banking/Finance Processing Applications

INPUT

NOTES:

JJ88-RG2-26a

Most Successful Applications Areas for Turnkey/VARs

- Telecommunications

- Legal Applications

- MRP Systems

INPUT

NOTES:

JJ88-RG2-26b

INPUT

Conclusions/Recommendations

- Become a Multi-Regional Turnkey Systems/VAR

- Increase Content of Industry-Specific Application Software

- Resell Proprietary Applications

- Increase Repeat Business to 50-60% Range

INPUT

NOTES:

JJ88-RG2-29a

IN

Conclusions/Recommendations

- Look to Installed Base as a Key Asset

- Emphasize Value-Added Services Such as Software Maintenance, Consulting, Education, and Training

- Stress Hardware and Software Add-Ons

INPUT

NOTES:

JJ88-RG2-29b

INPUT

Conclusions/Recommendations

- Increase Emphasis on Follow-On Products

- Develop Strategic Alliances

- Take Advantage of New Applications Development Tools

INPUT

NOTES:

JJ88-RG2-29c

IN

Conclusions/Recommendations

- Explore UNIX-Based Hardware Platforms

- Focus on On-Going Revenue Sources

- Develop Applications Around Industry Standards

- Increase Emphasis on Network Integration

INPUT

NOTES:

JJ88-RG2-29d

INPUT

SI Market Definition

Integrated Solution to a
Multidisciplinary Information
Systems Requirement

NOTES:

JJ88-JF2-2

Systems Integration Expenditures Forecast

$ Billions

- 1988
- 1993

AAGR 31%

8.9

AAGR 18%

2.3

2.5

5.7

Commercial   Federal

INPUT
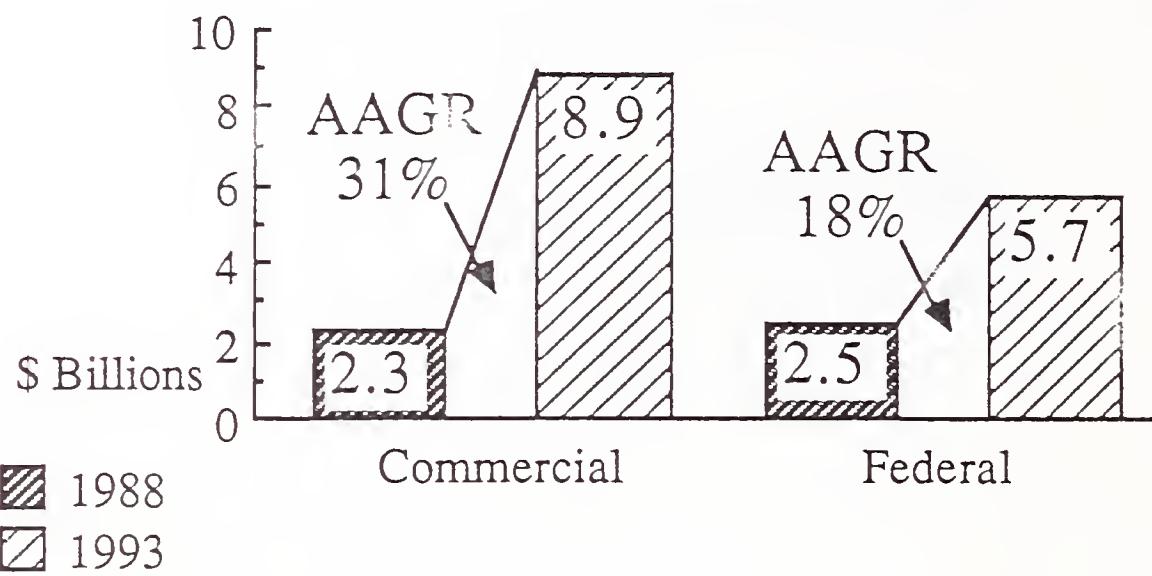
NOTES:

JJ88-JF2-4

Expenditures by Industry
1988-1993

AAGR

Discrete Manufacturing — 2.3 / 0.6 — 33%

State and Local Government — 1.1 / 0.4 — 26%

0 1 2 3
Expenditures ($ Billions)

▨ 1988
▧ 1993

INPUT

NOTES:

INPUT

Expenditures by Industry 1988-1993

AACR

Banking/ Finance 1.5 — 0.24 — 44%

Distribution 1.3 — 0.24 — 40%

1988
1993

0 1 2
Expenditures ($ Billions)
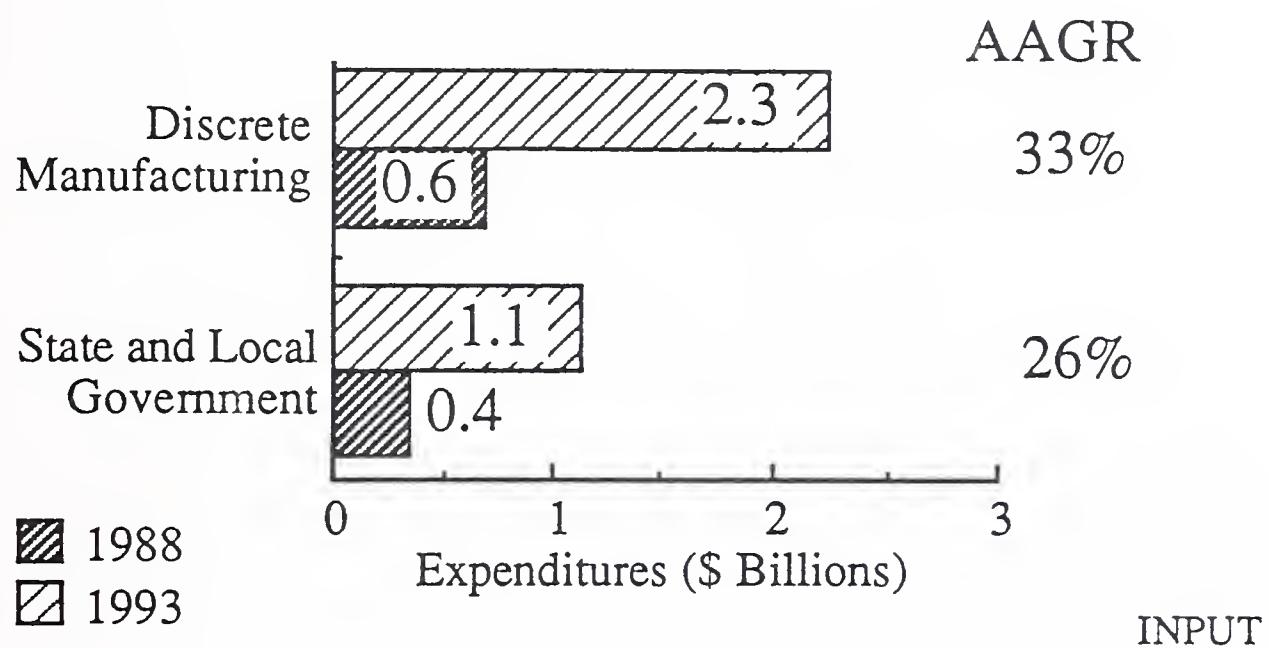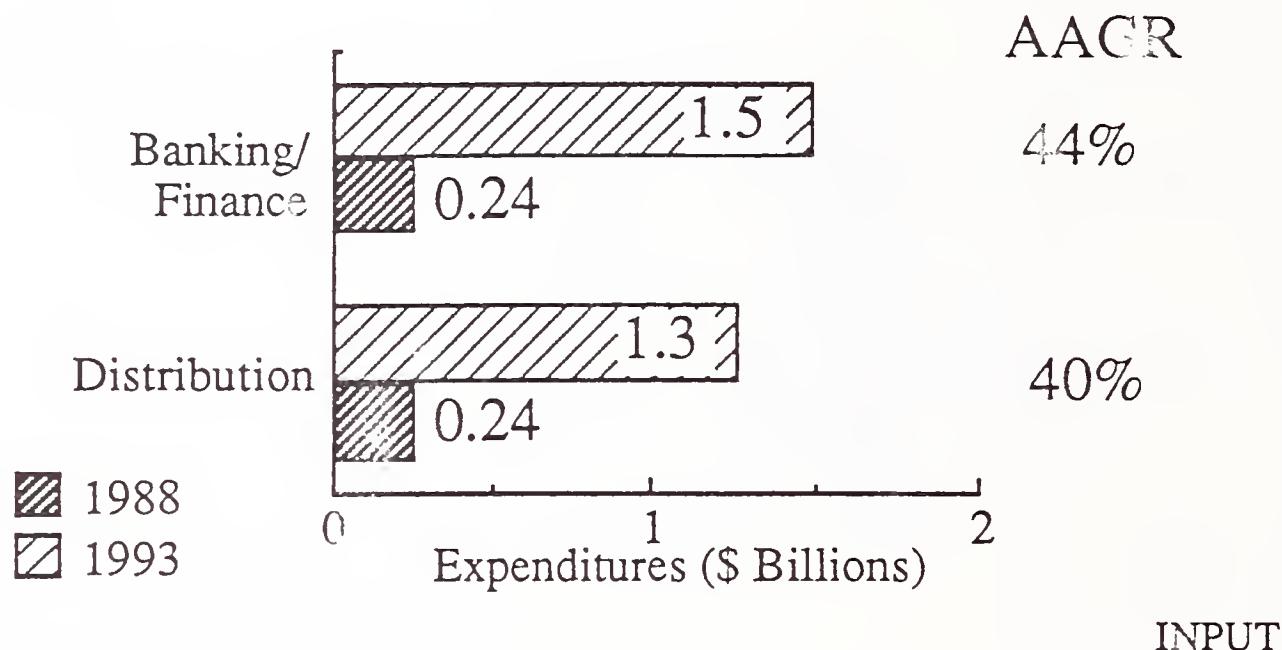
NOTES:

JJ88-JF2-6

Expenditures by Industry
1988-1993
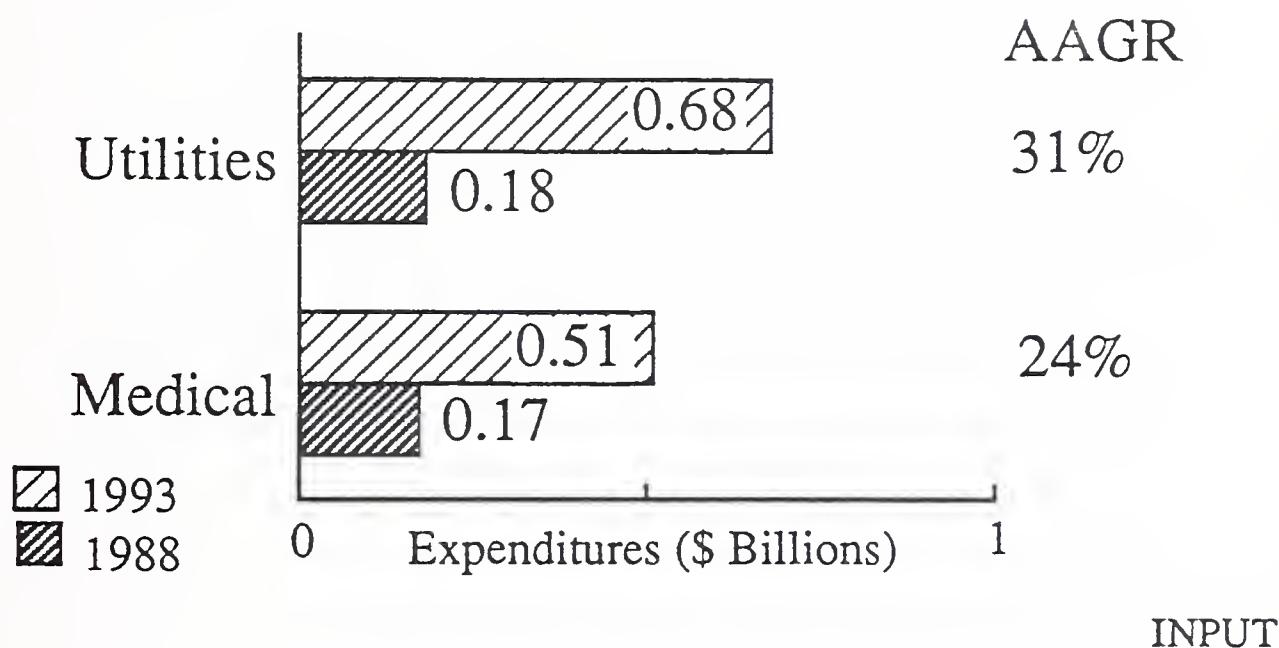
AAGR

Utilities — 0.68 (1993), 0.18 (1988) — 31%

Medical — 0.51 (1993), 0.17 (1988) — 24%

1993
1988

0   Expenditures ($ Billions)   1

INPUT

NOTES:

JJ88-JF2-7

INPUT

Major Issues—1988

- Rising Management Expectations
- User Demands for Increasingly Complex Solutions
- Managing the Technology Investment
- Integration—Data/Applications /Technology
- "Mission Critical" Solutions

INPUT

NOTES:

IN

Buyer Issues—Vendor Selection

- Selection Criteria/Process
- Environmental/Organizational Impacts
- Project Management Issues
- End-User Perspectives

INPUT

NOTES:

JJ88-JF2-16

Technology Drivers—1988

- Relational Data Structures
- Open Systems Standards
- Multiplatform Software
- Microcomputer Sophistication
- Communications Product Range

INPUT

NOTES:

JJ88-JF2-17

Implications for Vendors

Trend	Implication
Buying Trends	
User Becomes Buyer	Application Emphasis
Solution Complexity	Development Emphasis

NOTES:

Implications for Vendors

Trend	Implication
Competitive Posturing	
Application Knowledge Critical Long Term	Major Alliances May Be Essential
Turnkey Market Weakening	May Want to Protect Key Subcontractors

INPUT

NOTES:

JJ88-JF2-28

Implications for Vendors

Trend	Implication
Strategic Focus	
Current Growth in Technology-Based Projects	Not the Long-Term Opportunity
Vertical Focus of Major SI Competitors	Further Exposure on Profitability

NOTES:

JJ88-JF2-29

Systems Integration Recommendations

- Present Full-Service Image

- Leverage/Promote
  Proprietary Technology

- Establish Strategic Partnerships
  (Alliances)

- Initiate and Maintain Overall
  Account Control

- Maintain Project Management
  Continuity

INPUT

NOTES:

JJ88-JF2-30,31

INF

Professional Services

NOTES:

JJ88-DWH-1

Professional Services
Market Structure

```
              ┌─────────────────┐
              │  Professional   │
              │    Services     │
              └────────┬────────┘
       ┌───────────┬───┴───────┬───────────────┐
┌──────┴─────┐┌────┴─────┐┌────┴──────┐┌────────┴──────┐
│  Software  ││Consulting││ Education ││ Professional  │
│Development ││          ││and Training││   Services    │
│            ││          ││           ││    System     │
│            ││          ││           ││  Operations   │
│            ││          ││           ││     (FM)      │
└────────────┘└──────────┘└───────────┘└───────────────┘
```

INPUT

NOTES:

JJ88-DWH-2

INF
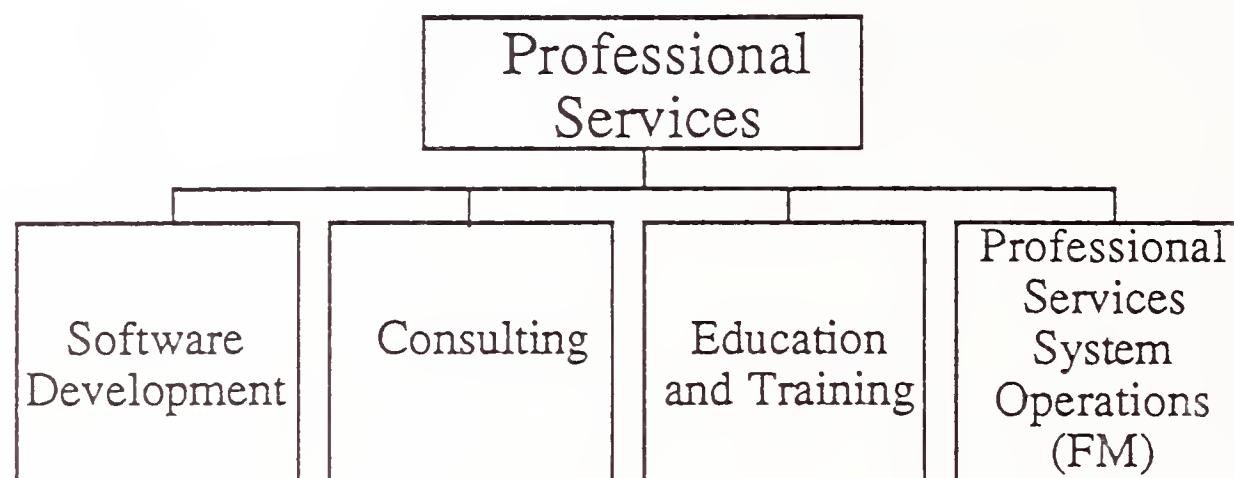
Professional Services Market— Driving Forces

- SW/Processing/Turnkey Vendor Positioning
- Vendor Alliances
- Diminished Skilled Labor Pool
- Specialized Skill Sets
- Project Control Methodologies

INPUT

NOTES:

JJ88-DWH-8A

Professional Services Market—
Driving Forces

- Lack of IS In-House Expertise
- Rising Labor Costs
- Low-Cost Market Entry
- Systems Complexity

NOTES:

JJ88-DWH-8B

Major Vendors' Shares of Total U.S. Professional Services Market—1987

Company Name	Revenue ($M)	Market Share (%)
IBM	1,017	7
CSC Corp.	521	4
Arthur Andersen	437	3
Unisys Corp.	414	3

INPUT

NOTES:

JJ88-DWH-10A

INPUT

Independent Vendors' Shares of Federal Professional Services Market—1987

Company Name	Revenue ($M)	Market Share (%)
CSC Corp	464	18
Mitre Corp.	343	13
Emhart (PRC)	250	10
BDM International	249	10
Grumman	240	9

INPUT

NOTES:

JJ88-DWH-12A

Independent Vendors' Shares of U.S. Commercial Professional Services Market—1987

Company Name	Revenue ($M)	Market Share (%)
Arthur Andersen	437	4
Arthur D. Little	285	2
TRW, Inc.	273	2
Boeing Computer Services	217	2

INPUT

NOTES:

JJ88-DWH-15A

Independent Vendors' Shares of U.S. Commercial Professional Services Market—1987

Company Name	Revenue ($M)	Market Share (%)
Coopers and Lybrand	190	2
Computer Task Group, Inc.	162	1
Peat Marwick Main and Co.	152	1

INPUT

NOTES:

JJ88-DWH-15B

INF

SI Impact on Professional Service Recommendations

- Is Bigger Better?
- Large Fish/Small Pond vs. Small Fish/Large Pond
- Assess Your Own Capabilities
- Plan a Clear Direction
- Work Your Plan

INPUT

NOTES:

JJ88-DWH-25

Big-Eight Accounting
Professional Services

- Predominately Accounting/Audit

- Professional Services Faster Growing

- Entering Software Markets
  - Arthur Andersen's *Foundation*
  - Peat Marwick's *Catalyst*

- Mergers/Acquisitions/Strategic Alliances

INPUT

NOTES:

JJ88-DWH-27

INP

Significant Mergers/Acquisitions in Professional Services

- Emhart (Planning Research)/
  Advanced Technology
- Nynex/AGS
- Ford Aerospace/BDM Intl
- Logica (U.K.)/Data Architects
- AEG (FRG)/DYNCORP

INPUT

NOTES:

JJ88-DWH-29

Professional Services Futures

- Minor Consolidation: Merger/Acquistion of Smaller Firms
- Increased Competition for Worker Bees
- H.R. 1706 Rollback
- Off-Shore Software Development
- "Maintenance" Opportunity

INPUT

NOTES:

JJ88-DWH-31

Opportunities and Recommendations

- Specialize in Industry Niches
- Develop Alliances within Other Delivery Modes
- Enhance Education and Training Offerings
- Follow Standards and Regulatory Processes
- Monitor New Technologies

INPUT

NOTES:

JJ88-DWH-32A,B

Processing Services

- Transaction Processing
- Utility Processing
- "Other" Processing
- System Operations
  - Vendor-Owned System
  - AKA "Facilities Management"

INPUT

NOTES:

MAAP-41

INPUT

Processing Services Forecast

1987=13.6

($B) User Expenditures

30 —
20 —
10 —
0 —

15.2 (1988)

25.8 (1993)

AAGR 11%
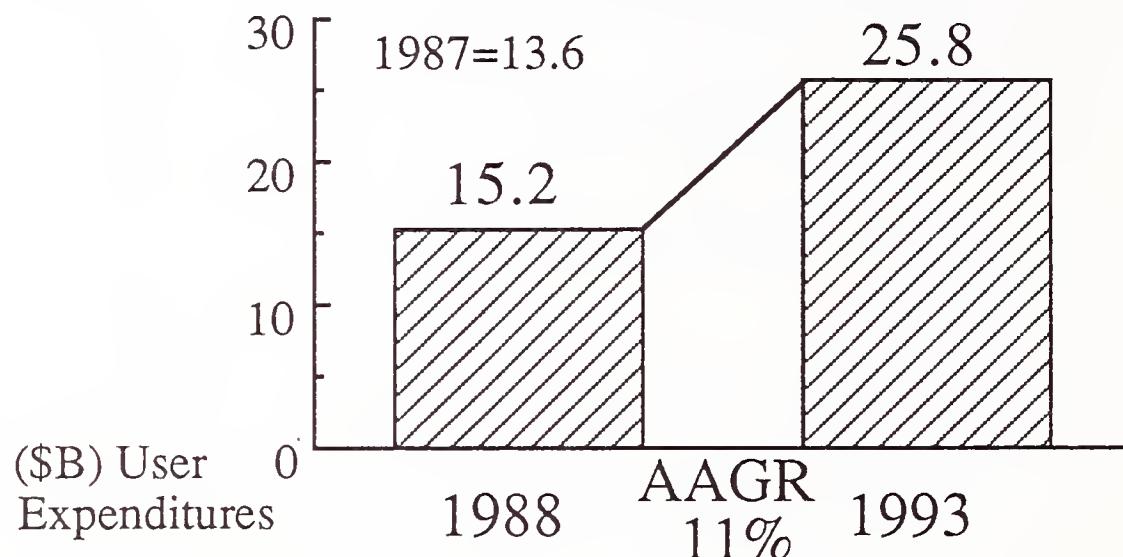
INPUT

NOTES:

INPUT

Vendor Activity
NDC

- ~~Merger with Medco~~
- Developing EDI
- Alternative Operator Services
- Credit Authorizations

INPUT

NOTES:

JJ88-VW2-18

Vendor Activity
McDonnell Douglas ISG

- Reorganization, Reorganization
- Lost $42.3 M in 1987
- → Systems Integration Strategy

INPUT

NOTES:

JJ88-VW2-20

Vendor Activity—
Network Leverage

AA Sabre

- Terminals ⟶ LAN Linked PS/2
- Network/Processing Service + Office System Sales

NOTES:

JJ88-VW2-23

Utility Processing—COM

- 60-Year-Old Technology

- Moving In-house

- Anacomp—Back to Fundamentals
 + Com Hardware

- Endata—Acquired by FFMC

INPUT

NOTES:

JJ88-VW2-28

Disaster Recovery
High-Speed Electronic Vaulting

T-1

Hot Site
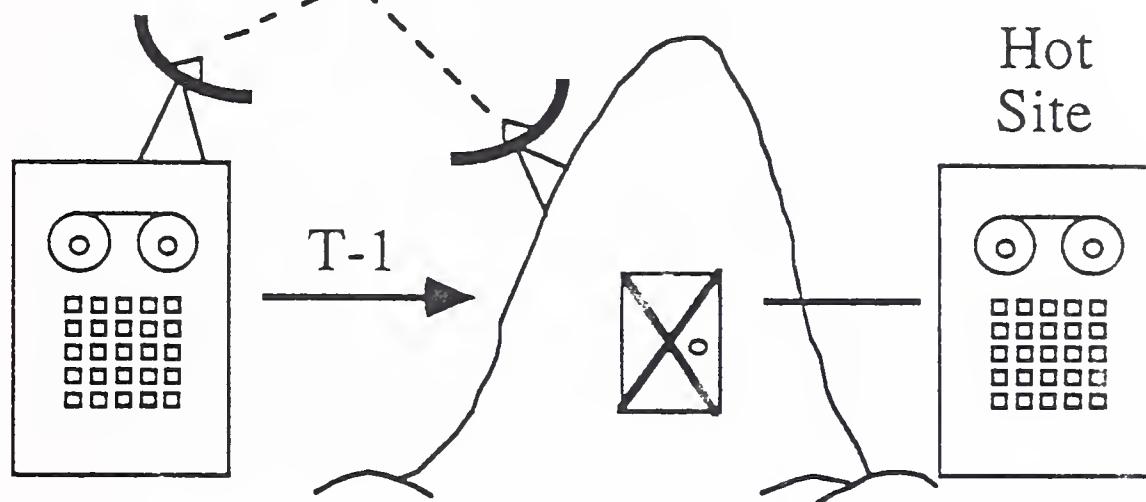
- Comdisco   - Sungard

INPUT

NOTES:

JJ88-VW2-29

Trends

Large Scale SI Projects

→

Facilities Management Contracts

INPUT

NOTES:

JJ88-VW2-31

Trends

- Fixed Length Contracts are Out, Flexibility is In
- Users Become Vendors
- Ample Bandwidth Available
- Technical "Solutions" Search for "Problems"

NOTES:

JJ88-VW2-34

Recommendations

- Evaluate Role of New Technologies/ Applications

- Determine How Transmitted Data Can Be Processed

- Understand Technical Requirements for Connection between User's Operations and Your Services

INPUT

NOTES:

JJ88-VW2-37

```
                    ┌─────────────────────┐
                    │  Network Services   │
                    └─────────────────────┘
             ┌─────────────┴──────────────┐
   ┌──────────────────┐         ┌──────────────────┐
   │ Network          │         │ Electronic       │
   │ Applications     │         │ Information      │
   └──────────────────┘         │ Services         │
     ├─ Enhanced Network        └──────────────────┘
     │  Applications (VANS)        ├─ On-Line
     │                             │  Data Bases
     ├─ EDI                        │
     │                             └─ News Data
     └─ E-Mail                        Bases
```
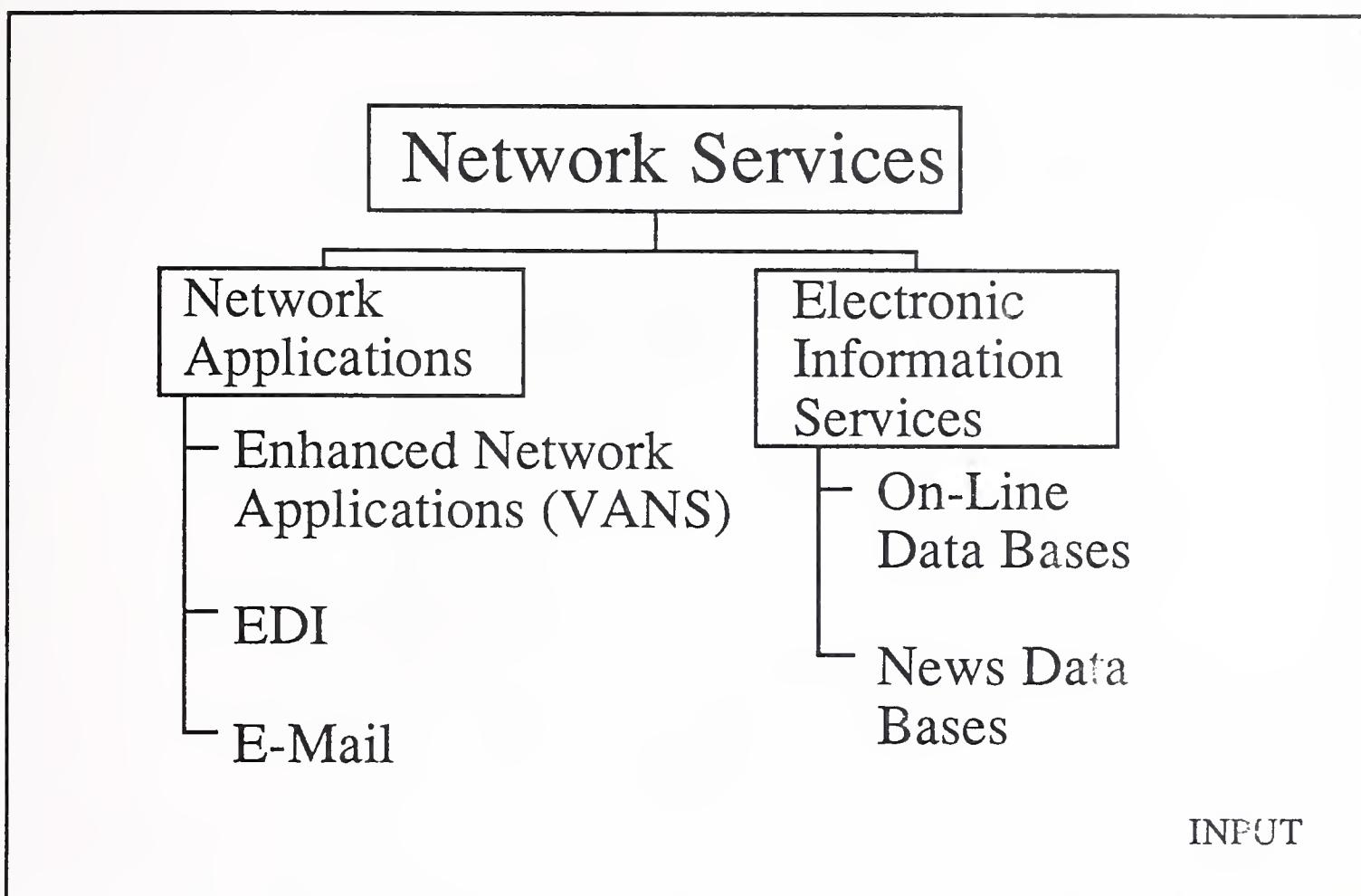
INPUT

NOTES:

INPUT

Network Services Forecast

20 —

1987=4.6

16.7

10 —

5.8

0 —

(\$B) User
Expenditures

1988

AAGR
24%

1993
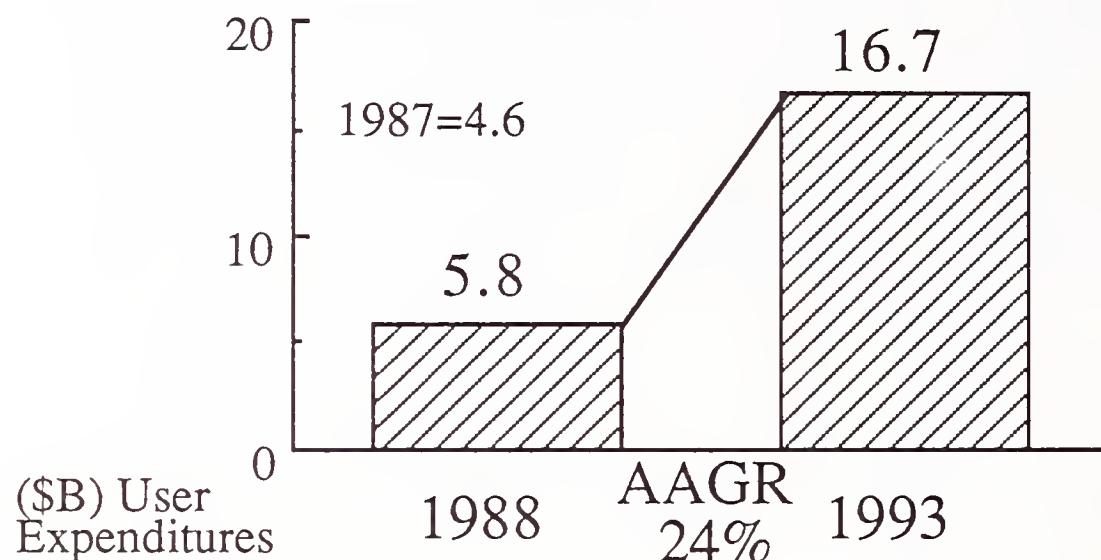
NOTES:

MAAP-47

Electronic Information Services Forecast

	1988	1993	AAGR
OLDB	4.1	9.4	18%
News	.6	1.8	29%
Videotex	.2	1.2	40%

$ Billions
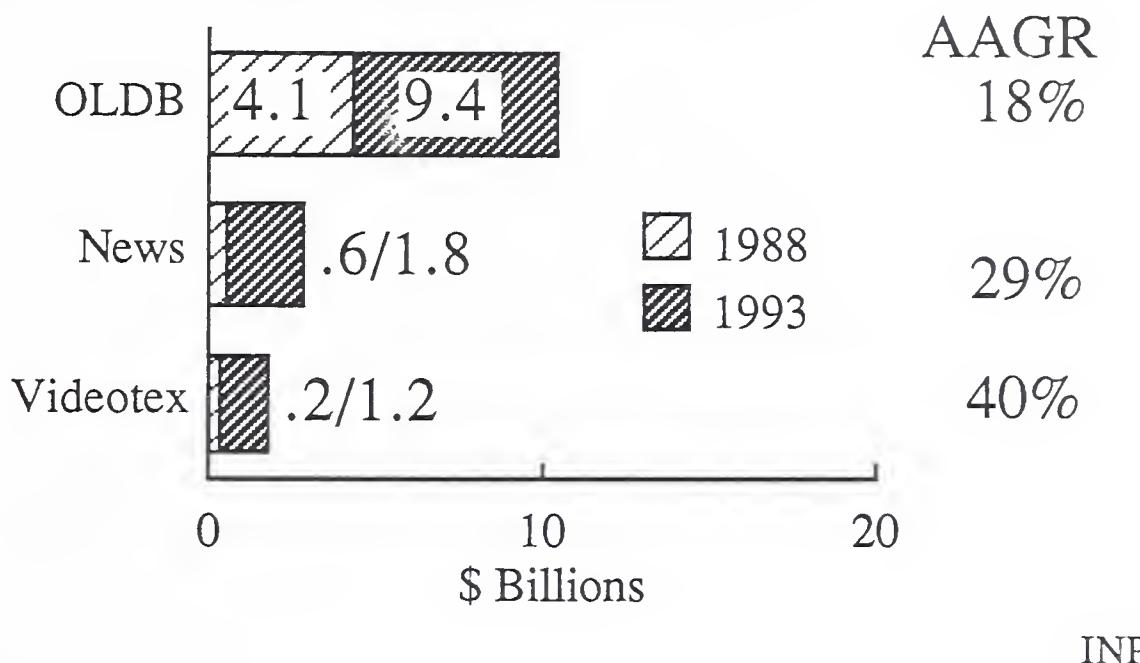
NOTES:

MAAP-49

Forecast Factors

EDI Status
(IS Managers)

No Plans — 22%   24% — Considering

34%   20% — Active Planning/ Implementing

Now Using
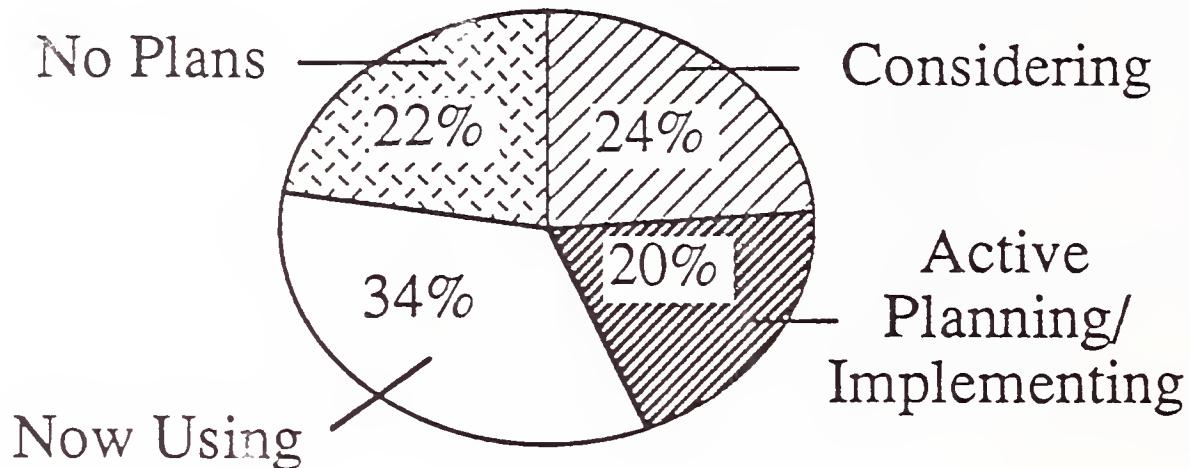
INPUT

NOTES:

JJ88-VW2-7

Forecast Factors

Number of EDI Trading Partners

(Bar chart showing: Now = 112, 66% Increase, End of 1988 = 186; y-axis 0 to 200)
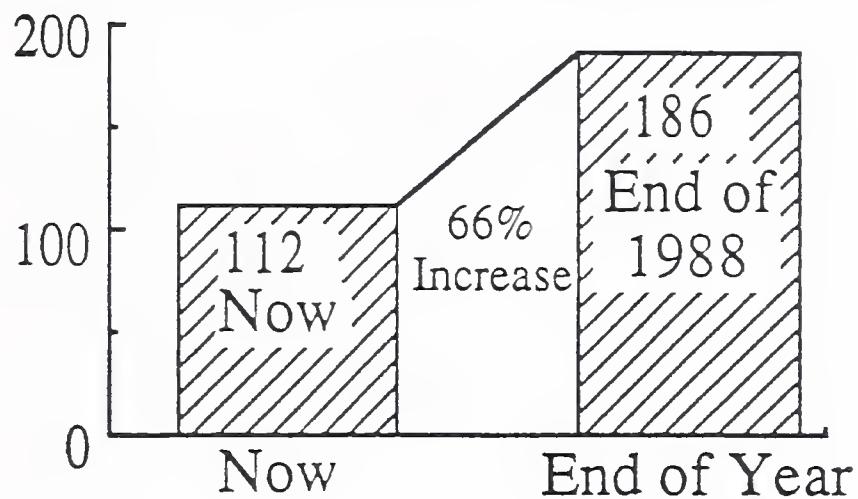
INPUT

NOTES:

JJ88-VW2-9

INPUT

EDI Network/Processing Service
Market Shares

Others
13%

GEIS
21%

Railinc
6%

Excludes Private
Networks,
EMC, Interface,
Federal

Transnet
7%

IBM
6%

SSW
18%

Kleinschmidt
13%

MDC
16%
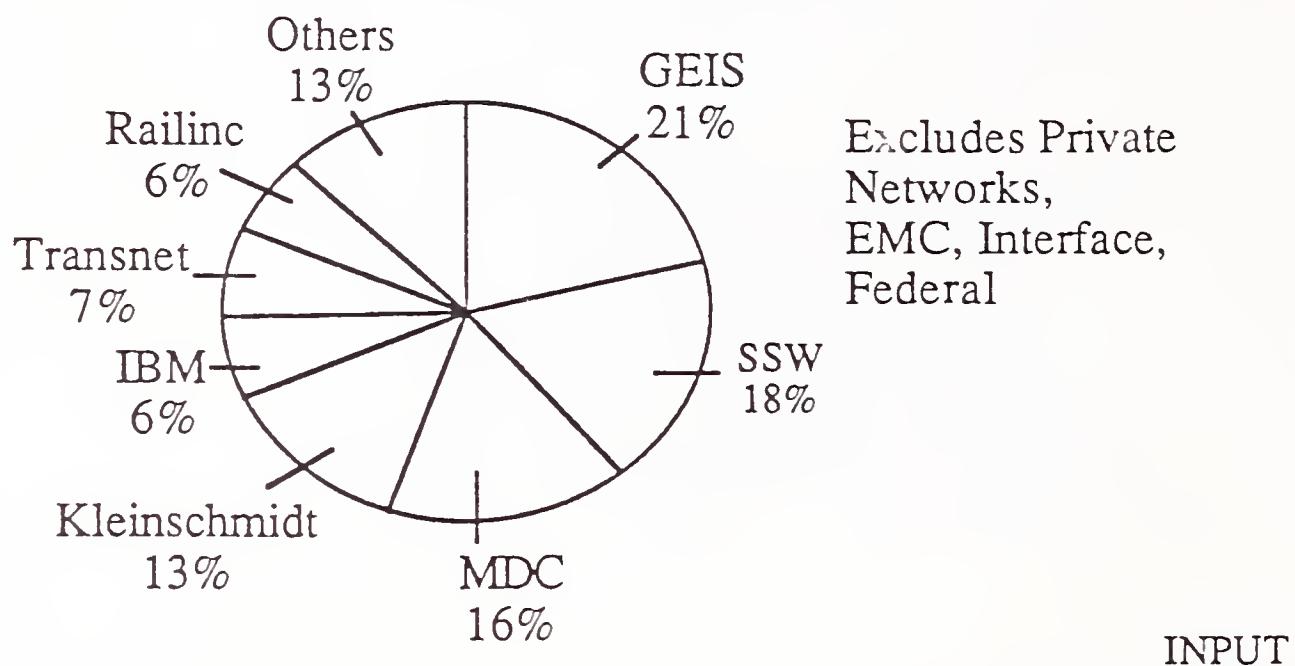
INPUT

NOTES:

EDI Traffic Becomes a Data Base

Document		RCS OR VAN		Document

Document — RCS OR VAN — Document

Document — — Document

EDI-Generated Data Base
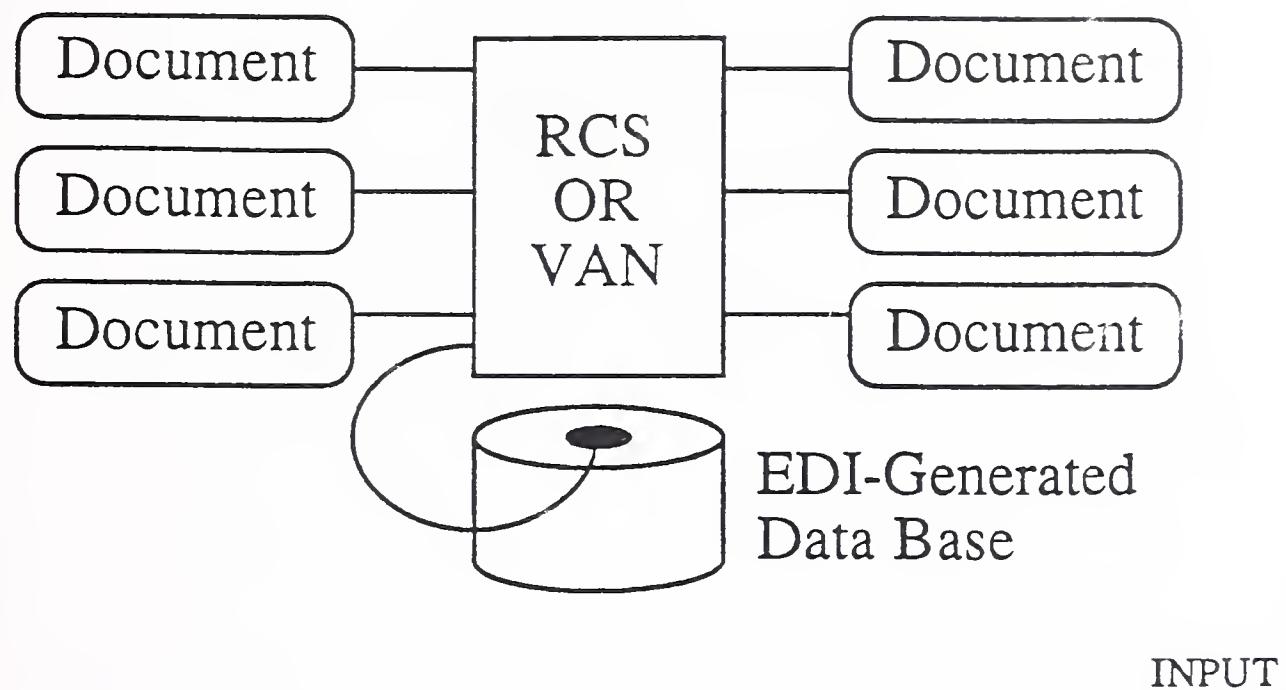
NOTES:

Vendor Activity

Shifting Ownership

U.S. Sprint & Telenet Communications

GTE ⟶ United Telecom

NOTES:

JJ88-VW2-19

Trends

- OLDB Consolidation
  - Dialog/Knight Ridder
  - CSC/Equifax Credit Reports

NOTES:

JJ88-VW2-24

Vendor Activity—Alliances

- CSC—European PTTs
- AT&T, BT, KDD

  "One Stop Network Services"

INPUT

NOTES:

JJ88-VW2-21

OLDB Opportunity

- International Access
- Multi-Lingual, Real-Time Translation

NOTES:

JJ88-VW2-27

RBOC Network Services (LADTS)

- Gateways

- Deep Pockets, Existing Plant

- Marketing Limitations
Future: CATV?

NOTES:

JJ88-VW2-30

# Interesting Network Technologies

- Mobile Satellite
- Mobile Data
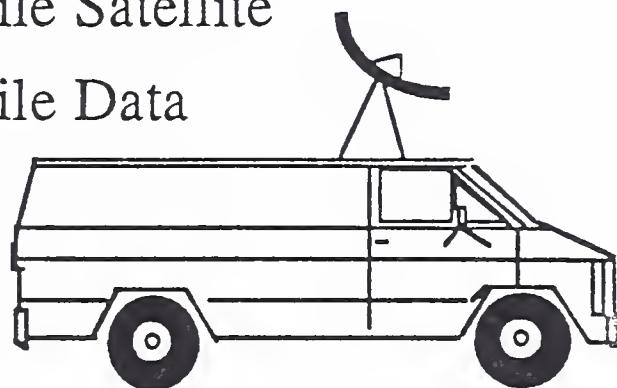
NOTES:

JJ88-VW2-32

Interesting Network Technologies

- FAX Store & Forward
- FM SCA Broadcast Data
- Video Phones
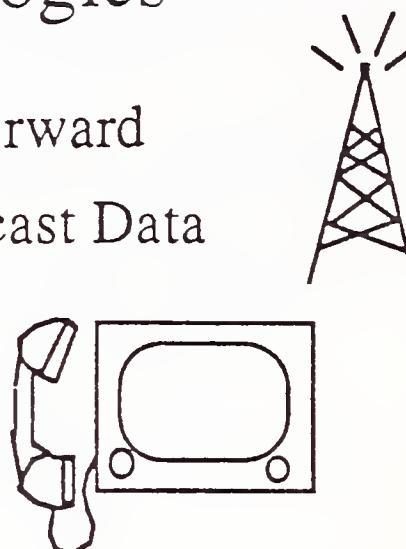
NOTES:

JJ88-VW2-33

Network Services Opportunities

- RBOC Gateways, Services

- Network Design, Operation

- OLDB: International Access

- Multi-Lingual, Real-Time Translation

INPUT

NOTES:

MAAP-55

INPUT

Largest IS Vertical Markets

CAGR

Banking/Finance	9.4 / 19.8	16%
Discrete MFG	8.0 / 16.2	15%
Federal Govt.	7.6 / 13.7	13%

User Expenditures ($B)

▨ 1988
▨ 1993

INPUT

NOTES:

MAAP-60a

INPUT

Largest IS Vertical Markets

CAGR

Market	1988	1993	CAGR
Process MFG	3.8	8.9	18%
Medical	3.6	7.5	16%
Insurance	3.3	6.6	15%

☒ 1988
☒ 1993

User Expenditures ($B)
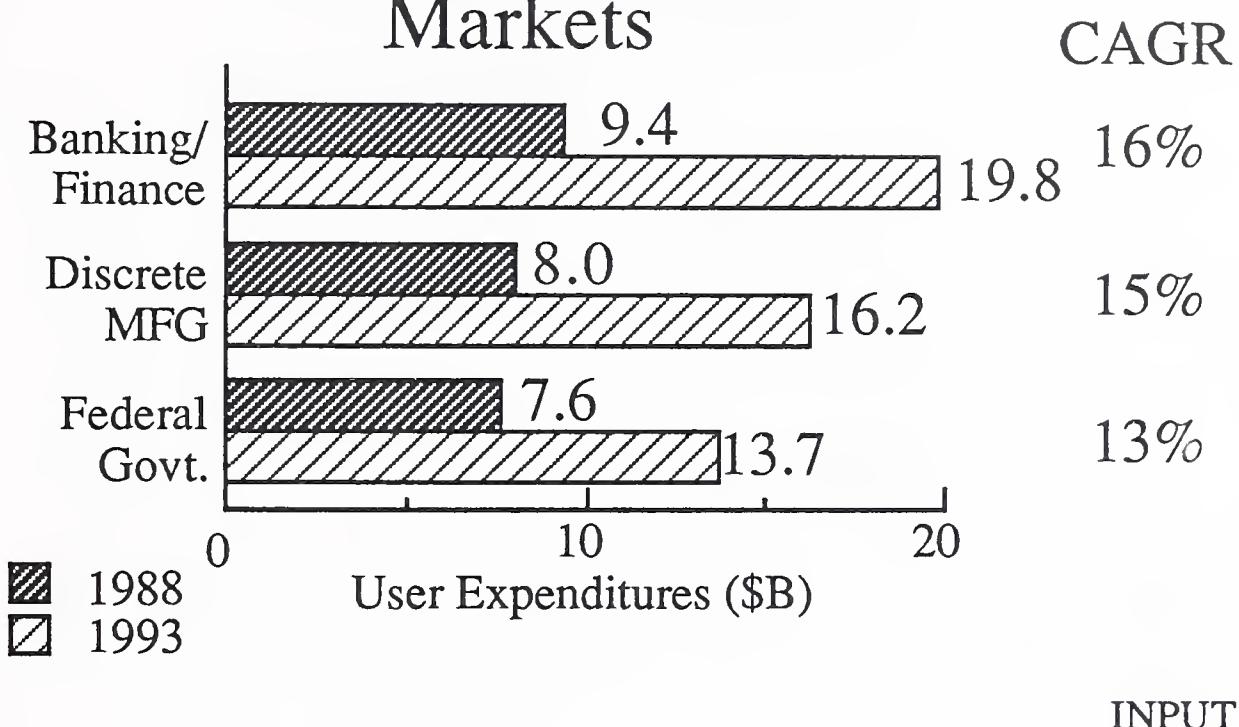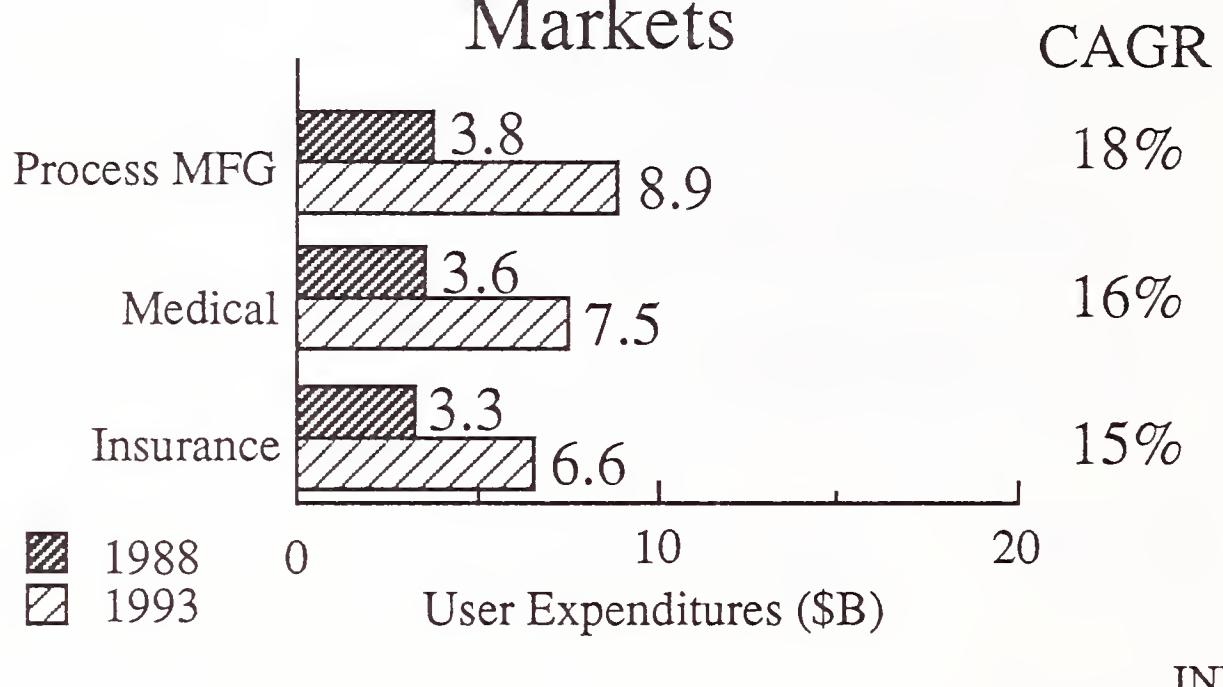
NOTES:

MAAP-60b

Trends—
Discrete Manufacturing

- Large Market, Still Growing at 15%

- High-End MRPII Saturation

- Micro-Based Solutions & Workstations

- Need for Integrated Systems

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NOTES:

MAAP-63a
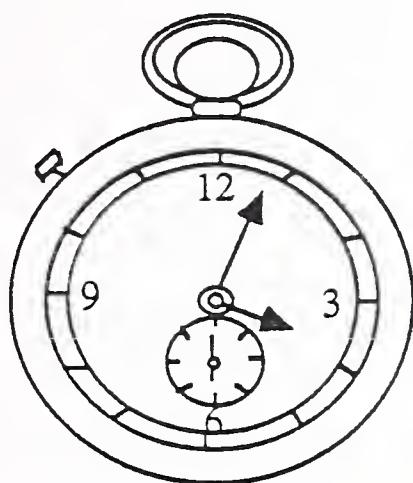
"Time—
The Next Source of
Competitive Advantage"
                    - HBR July/August 1988

- Attack Opportunities

- Adjust to the Requirements

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NOTES:

JJ88-VW2-38

Hewlett-Packard
Recommendations for Continued Success

- Continue to Develop "Open System" Products
  - Openview (Open Systems Interconnect)
  - New Wave
  - HP-UX
  - OSF Involvement

- Target Vertical/Niche Markets

- Focus on Workstation/PC Development
  Tools/Environment

- Develop Transaction Processing & Relational Data
  Base Strengths

- Become a "Systems Integrator"

- Emphasize Professional Services
  - Education /Training
  - Consulting
  - Software Development

- Acquire Specific Software Skill Sets (Acquisition
  or Merger)

- Leverage VAR Position

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MAAP-76

VAR Perspective
H-P Advantages

- Sales Force

- Customer Support

- Customer Loyalty

- VAR Support Programs

- Open Systems Philosophy

- Risc Architecture

- New Wave (Legal Problems Aside)

VAR Perspective
DEC Advantages

- Single Architecture/Distributed Systems

- RDBMS

- Networking Capability

- Price-Performance (?)

- "Hot" Hardware

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